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Mildly/moderately intellectually disabled learners and the use of computers for literacy learning

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Mildly/Moderately Intellectually Disabled Learners and the use of Computers for Literacy Learning

A thesis submitted in fulfilment of the requirements of the award of the degree

Master of Arts (Honours)

from

THE UNIVERSITY OF WOLLONGONG

by

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DECLARATION

This is to certify that the work presented in this thesis has not been submitted to any other University or Institution for the award of a degree. That the work is entirely my own work and has been carried out during the period of my candidature.

Jane Cook
ABSTRACT

This study has investigated the premise that the literacy learning of mildly/moderately intellectually disabled students is assisted by the use of the computer as a writing tool. An analysis of the role of the computer in the progress of learning disabled students language competence has been carried out.

The naturalistic paradigm was the theoretical model adopted as the organiser of the methodology. The interactive relationship of researcher and subject has been acknowledged.

The students revealed their capacity to learn in the way they explored the computer and in the way they responded to the texts and literacy models they encountered in the classroom. A range of literacy encounters, relating their own experience and to experience in other contexts was transferred to the computer in their composed texts.

The use of the computer facilitated writing by solving the problem of letter formation which is often difficult for young learners and particularly for those with motor control difficulties. The ease with which errors could be corrected was also an asset. The computer was motivating and stimulated the students to engage with the task of writing. The visibility of the product which allowed an interactive relationship between student, researcher, teacher and peers contributed to the social context which proved to be a major factor in the literacy learning environment.
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CHAPTER I

INTRODUCTION

Purpose of Study

The purpose of this study is to critically examine and analyse the literacy related behaviours of children with learning disabilities as they used a classroom based computer as a writing tool. At a more specific level it aims to develop a grounded theory of computer assisted literacy learning for the intellectually disabled student in a special class setting.

The class observed was a junior integration class in a special purpose school. (The class was 'integrated' into a regular primary school setting for two days per week.) The philosophy of literacy facilitation which characterised the literacy curriculum could be described as 'whole language'. This is a very inclusive approach to literacy which seeks to incorporate all aspects of language learning - drawing - writing - reading - role playing - music - dance - library - story telling - use of environmental media and the extension of learning activities across all areas of the curriculum. This approach is inherent in the writings of Goodman (1986), Graves (1981, 1983), Harste, Woodward and Burke (1981, 1984). The purpose of integrating the use of the computer into the language environment of the class was to enable a close scrutiny of literacy learning behaviours and to make explicit the effects of the use of the computer on those behaviours.
Because the study is based on an emergent design it is not possible to specify *a priori* hypotheses to be tested or questions to be answered. However, a number of broad questions formed a conceptual framework for the study in its beginning stages.

i. What is the potential for the use of computer technology in literacy education for mildly/moderately intellectually disabled learners?

ii. What is the relationship between student motivation to attend to and explore literacy concepts/skills and computer technology?

iii. How does the learning disabled students' skill and knowledge in writing develop when computer technology is used in the class setting?

iv. What is the potential role of computer technology in the literacy acquisition of learning disabled students?

v. What is the range and nature of coping strategies learning disabled students use in a whole language setting?

**Definition of Terms**

**Learning Disabled/Intellectual Disability**

In the changing climate in education in Australia in the late 1980's special education was undergoing restructuring. As in many other countries in the late 1980's and continuing on into the 1990's education was being scrutinised and reorganised in response to changing views and policies. In New South Wales where this study was carried out two recent reports, The Schools Renewal Plan (The Scott Report, 1989) and the Report of the Committee of Review of New South Wales Schools (The Carrick Report, 1989) have had considerable impact in the field of special education. For
example changes in schools management stemming from the Scott Report have been implemented resulting in staffing and resources becoming the responsibility of the schools. The Carrick Report has argued that the definition of children requiring special education is contentious and terms need to be rationalised.

The term 'developmental disability' was adopted by the Department of Health, N.S.W. in a report published in 1983, (State Health Publication No (DP) 83-020 ), this report stressed the need to avoid the stigma associated with the term 'intellectual handicap' and suggested that the term adopted by the (then) Health Commission would:

(i) replace the stigmatised expression of "mental retardation" and "intellectual handicap"

(ii) emphasise the developmental or educational/learning nature of the disability and the services required to assist clients."

The N.S.W. Council for the Mentally Handicapped in response to the (then) Health Commission draft Policy Document (cited in the State Health Publication) defined a person who is intellectually impaired "as one who has one or more impairments which limit that persons rate and extent of learning so that he or she cannot achieve competence for living or working as an adult without assistance related to the persons limitations... IN OTHER WORDS... intellectual handicap of itself is a learning condition". (State Health Publication No (DP) 83-020, (1983), Part 2, p13.

In 1982 a report of the Working Party on a Plan for Special Education in NSW, Strategies and Initiatives for Special Education in New South Wales, (The Doherty Report), heralded the beginning of many changes in the
education of children with special needs. This report adopted World Health Organisation definitions. The Doherty Committee used the term "developmental disabilities and learning difficulties" to include children with intellectual, physical and sensory or behavioural disturbance handicaps who required special education or support services. It also included those students identified as having "specific learning problems", that is those requiring systematic remedial education.

This definition may be regarded as contentious because it includes children without identifiable or manifest handicapping conditions who experience learning difficulties. This group has only recently been recognised as requiring special education services. Clarification of this situation has been attempted by distinguishing between a specific learning disability which severely impedes academic and social development and a learning difficulty which could be overcome by re-teaching and remedial assistance. Special education programs have been recommended for students with learning disabilities and remedial programs for students with learning difficulties.

In summary, a definition of students needing special education which drew on current thinking would refer to those with disabilities of the following types:

- physical
- mild to profoundly intellectual
- multiple
- sensory impairments
- emotional and behavioural disorders
- learning difficulties
Definitions used by the committee

**children with special learning disabilities:** children whose learning process is directly affected by one or a combination of sensory, physical, psychological or intellectual impairments

**children with special learning difficulties:** children whose learning difficulties may be the result of non-manifest disorders or of environmental factors

In Australia today, the distinction is made between Learning Disabilities and Learning Difficulties. A student with learning difficulties is defined in the Carrick report, (in accordance with the World Health Organisation definition), as "A pupil with a learning problem is one whose delay in learning is not the direct result of disability in one or a combination of sensory, physical, psychological or intellectual areas." Students with a learning disability are defined in this report as those "whose learning progress is directly affected by one or a combination of sensory, physical, psychological, or intellectual impairments." Carrick Report, (1989 pp 219,220).

In the terms of the Carrick Report report the students taking part in this study would be labelled as having learning disabilities in the mild to moderately intellectually disabled range. In this study the terminology, learning disabled or intellectually disabled students (ID students) will be used. In an interview with the school principal it was stressed that although in standardised diagnostic tests some of the students might appear to be in the Mildly Intellectually Disabled range (IQ 55-80), functionally they would
be operating in the Moderately Intellectually Disabled range (IQ 30-55). (The author did not use any such instruments, all references to any such tests refer to information from school records and to tests administered by authorised persons.)

**Computer Technology**

For the purpose of this study computer technology refers only to the use of the computer as a tool for writing /literacy learning. A commercial word processing package Bank Street Writer, developed by Intentional Educations, Inc, Franklin E. Smith and Bank Street College of Education, and published by Scholastic Inc., (1982) was used as the basic software.

**RATIONALE FOR STUDY**

This study can be justified on a number of grounds: Firstly it will add a new dimension to the theoretical aspects of literacy learning for the learning disabled student. The detailed analysis of student progress will provide information on learning processes which have not been so closely studied before because there are few longitudinal studies which focus on the concerns of this study. Much of the work done in this area has been short term, hypothesis testing research. Data collection for this study commenced July, 1985 and continued through to 1989. In a recent review of the literature Marilyn Cochran-Smith found that there were very few studies in the area of word processing for writing with learning disabled students. She mentioned only three, Morrocco(1987), Morrocco & Neuman(1986), and Rosegrant (1984). (Cochran-Smith,1991).

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The naturalistic perspective of this study allowed for observation of the students self-directed learning in the natural setting of the classroom. It is hoped that this study will illuminate some of the possibilities for the use of technology in the education of students labelled as intellectually disabled.

Secondly, it is timely. In NSW, where the study was carried out, the need for a comprehensive study of the use of computers in special education is apparent in the light of State Government policies on education. The Schools Renewal, a report of the Management Review set up by the Minister for Education to examine all aspects of his portfolio, (The Scott Report, June, 1989). Suggested that "Principals of Special Schools should be able to use their global grants to purchase professional development and support services appropriate for their schools." (Schools Renewal, 1989, p23). The NSW Minister for Education and Youth Affairs, Dr T. Metherell, in the NSW Plan for Special Education (1989), adopted the principle that the latest technological advances in communication should be investigated and utilised where appropriate and recognised that the use of technology can greatly enhance the learning opportunities of students with disabilities. The section on Government Undertakings included making greater use of word processors, computers and other technology, especially for remedial work. This would be facilitated by the provision of funds for purchase, trialling and evaluation of technology appropriate to the needs of students with disabilities and learning difficulties.

The Report of the Committee of Review of New South Wales Schools, (The Carrick Report, 1989), notes "..as competence in language is of central
importance in enabling understanding, the learning process will be significantly facilitated, or hindered, by the degree of language competence." (p.42). The report also notes, "it is unlikely that students will learn at the same rate and with the same understanding of what is to be learnt even if they are presented with the same learning situation." (Carrick report, p 42)

In view of the continued impetus for the integration of special education students into the regular classroom it is of vital importance for these students to be competent in language use, and hence understanding, to give them the opportunity to participate in the regular class learning situation. It is equally important therefore, that these students be familiar with the technologies they may encounter in the regular classroom where fellow students will be computer users. There has been much emphasis in recent times on the role of computers in education, but the reality often is that computer use in schools is very limited. For example in a survey of computer use in rural schools in Australia, 1988, primary schools were found to have an average of two computers per school and secondary schools 15 computers on average. Most of the schools reported insufficient student access time to computers. The issue of teacher expertise in the use of computers was also raised in this study with formal training of teachers in computer use consistently reported to be insufficient (self and peer education often being the reported source of training). (Fasano, Hall & Cook, 1988, p 74) The situation in urban schools is believed to be comparable to that in rural areas. This study addresses some of these issues.

Thirdly, there is a need for longitudinal investigations of the processes and strategies which intellectually disabled students use in the learning regime.
This is particularly important for educators now that the process of integrating these students into regular classrooms is being implemented.

Fourthly, the study can be justified in terms of long-term educational goals. Educators need to know how computer technology might affect language learning. For learning disabled (ID) students the control of language at all levels of discourse can mean liberation from dependence on others for many of the fundamental operations which are part of daily living. This study may contribute to establishing the use of technology as a support to literacy learning which can be tailored to the intellectually disabled child's capabilities. Competence in the use of the computer may be the catalyst that is needed to help them overcome some of the problems they experience as a result of their disability. On the other hand, it may be that computer technology is inappropriate for the ID students operational level of competence.

Finally, it can be justified on equity grounds.

The Carrick report puts forward some principles underlying special education provisions which are often stated in recent reports and publications which include:

" a child with disabilities has the right to an appropriate education to the fullest extent possible;
the education should draw on recent advances in technology, assessment and educational diagnosis, service delivery, teaching techniques, therapy services and co-operative parent-school relationships; " (Carrick Report, p 220).

The current emphasis on the use of technology and advances in service delivery and teaching techniques make the subject area of this study highly
relevant to the current situation in special education in NSW and elsewhere. It attempts to addresses some of the issues associated with technology and its use in special education.

Finally, workers in the field of special education have reported impressive gains in communication and intellectual stimulation for physically disabled individuals, using computers and associated technologies. However, there has been little research into the benefits of a computer supported learning environment for students who are not significantly physically handicapped but who are intellectually disabled. This study should provide some answers to questions which have not been addressed previously.

BACKGROUND TO STUDY

This study grew out of a previous project using a word processing program to aid writing skills with students from a Special OA Class (Opportunity A, of mildly intellectually disabled students, IQ in the range 55 to 80) in a general primary school. The obvious engagement of attention and focus of effort displayed by these students and the change in attitude of their non-disabled fellow students towards them when they were perceived to be using the computer competently gave a marked boost to their self esteem. This motivated me to explore the computer's potential with students in a special school, this time looking at a range of programs which might be suitable for use with intellectually disabled students. The possibility that the computer could be used specifically to aid literacy learning for intellectually
disabled students was discussed with the school principal and this project was commenced.

I began tentatively with short-term trials involving a range of students across different age levels and abilities. I used a word-processing program to assess the students response to the computer as a writing tool. The results of these explorations revealed a general interest in using the computer from all students involved. The fact that the software used was not game oriented but was merely a word processing facility did not seem to lessen their enthusiasm. The satisfaction gained in being able to write and express opinions in a form which could be understood by peers and teachers, (i.e. clearly legible) even though on a very limited scale seemed to be very important. It gave a sense of achievement to the students, particularly those who had motor control problems and consequent difficulty with letter formation. One of the conclusions I drew from the trial was that the interactive potential created as the students responded to the use of the computer could prove to be a force which might stimulate and extend intellectual activity in the course of their writing.

There were many promising sequences with a number of students which could have provided interesting case studies, the pilot observations confirmed my belief that further investigation would be worthwhile. However, the intention to look at the use of computers in relation to the building up of literacy skills required more than a selection of short term case studies. It was decided that a longitudinal study would be needed. This pilot study was valuable in building up a familiarity with the way in which students responded to the computer. It also established a clear acceptance of
my presence and of trust between staff, students and observer in addition to providing valuable background information.

Since that time the school has purchased a number of computers and set up a computer room which can be used by different classes and has one computer which is mobile for transfer to classrooms as required.

Overview of the Study

The study initially involved the observation of a class of eleven students. While class numbers were generally maintained at this level the individuals changed. Some moved into more senior classes and a few went to other schools, while new students joined the group. Despite this flux of individuals there was enough continuity of class members for an analysis of their literacy related behaviours whilst using a computer in the classroom. All of the children participating in the study were within the five to eleven age group and were labelled as learning disabled in the mild to moderately intellectually disabled range.

A naturalistic mode of inquiry was employed throughout the study. I became accepted as a trusted member of the school group and a collaborative non-threatening relationship was established. This was maintained with all members of the class. There was always eager participation, there was never any compulsion. All of the teachers concerned were supportive and collaborated fully in the project at all times. They provided demonstrations of language learning activities and proved keen to integrate the use of the computer in the class environment. The Principals of the school (two over
the term of the project) were always very supportive and interested in the progress made. They were very generous in allowing access to the class and providing background information as well as advice and consultation as the study progressed.

Locus of the Study

The locus for the study was the class setting of the Junior Integration class, in a School for Special Purposes. It was agreed that this class would be the subject of the study. The Principal had advised me that in his opinion, the junior students would have most to gain from the introduction of the computer at the start of their formal education. This particular class, just beginning to participate in an integration program which took them into a general primary school for two days each week would benefit from being seen to be doing the same things (using the computer) as their peers in the other classes. The students in this class were in the mildly/moderately intellectually disabled range, in 1985 they were aged from five to eight. The study followed their progress whilst they remained in the class.

The teacher was most helpful, giving background information and offering full co-operation. It was decided that a 'settling in and getting acquainted period' was desirable and that the primary school where the class was 'integrated' for two days each week would be the preferred environment if permission could be obtained from the school principal. (This was granted and open access allowed to the class during their time in the school.) As time went on the class became more and more integrated into the primary school (host school) activities and it became obvious that the identifiable 'class setting' was no longer intact. It was decided that in order to
maintain the integrity of the class setting the study should take place in the Special School setting. The locus was therefore transferred to the home school in July 1986.

**Theoretical Orientation**

Like all research projects this study reflects the theoretical prejudices and beliefs and preconceptions of the researcher. The theory of literacy learning which girds the study is based on principles described by Halliday(1975), Holdaway(1979), Cambourne and Turbill(1987), Harste, Burke and Woodward(1984), Smith(1981,1982), Goodman(1976), Graves(1983) and others. Essentially it is an holistic, functional theory of literacy learning, which has been variously labelled as "Whole Language", "Natural" , "Process Oriented" as well as being the target of many other descriptors. The theoretical base is inevitably linked with theories of learning. Historically the foundations of the theoretical location lie in the work of Luria(1961,1976), Vygotsky(1962,1978), Wertsch(1985), Bruner(1966a,1983) and Chomsky(1968). It also owes something for more recent perspectives to Piaget(1970a), Flavell(1985), and Wood(1988). Special Education perspectives have been drawn from various sources, The Third Revue of Special Education (1976), The Warnock Report(1978), Kauffman & Hallahan (1981), Ysseldike & Algozzine(1982), Hughes & Hall(1989), Sugden(1989), Cole & Chan(1990), Coles(1987), and from numerous papers from journals dealing specifically with the Field of Special Education. Computers in education draws on the thinking of people such as Papert(1980) Goldenberg, Russell & Carter (1984) and on research findings reported in academic publications.
Chapter Overview

Chapter two will present a review of the literature which explores theories of learning and of language learning in particular in order to examine the significance of the existing theories in relation to the outcomes of the study. The research in the field of computer use is also relevant to the study and will be referred to in this chapter and throughout the text.

Chapter three will outline the methodology and theoretical constructs employed in ordering the data and identify significant themes and categories which emerged during analysis of data.

Chapter four will present data, discuss and review in the light of learning theories and the strategies and processes employed by the students identified in the study.

Chapter five will be concerned with analysis of the data presented and its significance in relation to literacy learning.

Chapter six will discuss the implications of the inferences drawn from the study for educational theories and practice in special education.
CHAPTER TWO

LITERATURE REVIEW

Introduction

This review draws on four broad areas of relevant literature: theories of learning and cognitive development; language learning/the acquisition of literacy; special education/intellectual disability; computers and writing in the classroom. In this chapter I intend to try to synthesize some of the theories and research propositions from these different areas in order to illuminate the influence of this literature on my study. From this it should be possible to trace the development of the inchoate working hypotheses which emerged from my reading, from my tacit knowledge and from the data obtained in the course of the study.

The major theoretical framework guiding this study is drawn from two overlapping domains of concern, namely, cognitive development and the language/literacy learning domains. In the cognitive area the influence of the Russian scholars Luria and Vygotsky, is strong as is the work of Bruner, Piaget and other workers in the field such as Flavell, Wood and others who have influenced the theoretical tenets which I hold. In the language area I draw on the work of Graves(1980, 1981, 1983), Chomsky (1968, 1975), Halliday (1975), Smith (1973, 1979, 1982), Harste, Woodward, Burke, (1981, 1984),
Holdaway (1979), Cambourne (1988), and others who have also influenced the development of the working hypotheses in this study.

The research methods I used were influenced by the work of Lincoln and Guba (1985), Bogdan and Bicklen (1982), Goetz and LeCompte (1984), as well as that of other researchers who choose to locate their studies within the naturalistic paradigm of enquiry.

**Theories of Learning and Cognitive Development**

This study draws on a range of research perspectives within the learning/cognitive development domain. The pioneering work of A.R. Luria & L.S. Vygotsky the Russian psychologists still remains relevant to the understanding of learning and the development of cognitive processes. Vygotsky focused on process in his investigations of intellectual operations in the development of the child as opposed to the traditional experimental focus on performance. He was studying "the course of development of process", in providing opportunities for children to engage in activities which could be observed but which were not rigidly controlled. The present study of intellectually disabled children is similar in orientation. It also focused on the process of learning, and was not performance oriented. The products (hard copy) which represented performance served to demonstrate the achievements of the students but were not pre-set goals, there was no pressure to perform. The aim of the study was to delineate and examine the learning behaviours exhibited and the strategies developed during literacy events in the context of the learning environment. Social interactions
which contributed to the learning process and the role of the computer were given special attention.

In Vygotsky's view, "detailed descriptions, based on careful observation, constituted an important part of experimental findings. Vygotsky maintained that if carried out objectively and with scientific rigour, such observations have the status of validated fact". (Cole, M., John-Steiner, V., Scribner, S., & Souberman, E., (Eds) 1978, p14). In this 1978 translation of Vygotsky, his theory of development has been elucidated. Vygotksy took the view that:

...what children can do with the assistance of others might be in some sense even more indicative of their mental development than what they can do alone. (Vygotsky, 1978,p 85).

Luria and Vygotsky both clearly rejected behaviourist theories of development and believed that basic cognitive processes developed in the context of the socio historical background of cultures. The two had published a monograph "Essays in the History of Behaviour" in 1930. (See Luria, 1976) Vygotsky's theory addressed the issue of higher cognitive functions and provided the framework to study the effect of culture on the development of thought. Luria's work in cross-cultural studies carried out in Central Asia was a direct outcome of their collaborative research. He interpreted his findings about performance differences between groups with differing educational and experiential backgrounds in a similar way to that which 'attributes performance differences between groups in two cultures to the same processes that give rise to performance differences between younger and older children in the same culture' (see Cole, Foreword in Luria, 1976). This has relevance and import for the study of intellectually
disabled people in that their educational and social experiences are often different to those of their 'unimpaired' peers.

Vygotsky stressed the problem of mismatch between the psychological structure of a child with handicaps and the structure of cultural norms. In these comments, he stressed the extent to which atypical children are treated differently by a social world tailored to the needs of "typical" children. (Reid & Stone, 1991 pp16-17)

Performance differences in some cases could be partially attributable to different treatment. A comparison could be made to people from different cultures who perform differently because of different backgrounds. The Vygotskian theory of the way in which cultures develop in socially structured ways implies:

...if we could study the way the various thought operations are structured among people whose cultural history has not supplied them with a tool such as writing, we would find a different organization of higher cognitive processes... as higher processes take shape, the entire structure of behaviour is changed. (Luria, A.R. 1979, p 45)

Vygotsky defined development in terms of the emergence or transformation of forms of mediation, and his notion of social interaction and its relation to higher mental processes necessarily involves mediational mechanisms." What he intended to convey by the term 'mediation' was to 'emphasise meaning and the communicative nature of signs' (Wertsch 1985, p 15). Man is not restricted like the lower animals to simple stimulus-response reflexes, he makes connections between stimuli and his responses through mediating links. The reflex is changed to a system in which the tools man uses to modify the environment become signs that can also influence behaviour in response to incoming stimuli. (Luria, 1976, foreword Cole)

Deborah Wells Rowe, drew on a semiotic theory of literacy learning and highlighted the mediation theory when she asserted "The central insight of a semiotic theory of literacy learning is that all understanding is mediated; that is, nothing is understood directly". (Rowe, 1989, p 1). Luria(1976), observed

Jerome S. Bruner has correctly noted that every perception is an inherently complex, active process of assigning incoming information to a familiar category, an event intimately involved with the abstraction and generalization functions of language. (Luria 1976, p 21)
Bruner (1966a, 1973c, 1983), provided research evidence which accorded well with Vygotsky's theories and clarified some of Vygotsky's concepts in the course of his own work. He contended that in his experience "no issue has gone through such a radical transformation as the significance of perception and the nature of the knowledge it yields." For Bruner, Vygotsky's 'zone of proximal development

\[ \ldots \text{consists in the child's capacity to use hints, to take advantage of others helping him organise his thought processes until he can do so on his own. By using the help of others, he gains consciousness and perspective under his control, reaches "higher ground".} \]

(Bruner, 1983, p139)

Bruner, like Vygotsky considered the role of society and culture to be of great import in the development of mind, he made this clear when he said:

\[ \ldots \text{the growth of mind is always growth assisted from the outside... the limits of growth depend on how a culture assists the individual to use such intellectual potential as he may posses."} \]

(Bruner, 1973c, p 52)

Bruner's theory has emerged as the basis for explaining more recent findings in writing research. Calkins related her observations of eight year old children's successive drafts to the one track quality of children's thinking commented on by Bruner in 'A Theory of Instruction' as they appeared to be sequels not revisions. Then a change occurred which highlighted Vygotsky's contention "What the child can do in cooperation today he can do alone tomorrow...", one of her students suddenly displayed a departure from the expected behaviour of her supposed developmental level and started to operate in a different way, rereading and reconsidering and revising by shifting between processes "drafting, writing, reading, correcting, recopying
and talking" - talking through with a peer. This occurred with other children in the study repeatedly as they continued to push beyond their developmental level. Calkins referred to this as "development had been switched to fast forward". (Calkins, 1983, p 57). The explanation lay in the cooperative, supportive atmosphere which had evolved in the class of teacher and researcher and peers all interacting and assisting as audience and conference participants. The social context provided the impetus for development, the teaching interacting with development. (Calkins, 1983, pp 58-60). According to Vygotsky "...the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe but at the ripening functions..." (Vygotsky, 1962 p 104)

In his studies of cognitive development Flavell points out problems with the stage-by stage developmental process of Piaget. "The existing evidence suggests that cognitive growth is not as strongly and clearly a stage-like process as Piaget's theory claims it is." (Flavell, 1985, p 300) Piaget's theory professed that "children's thinking is different in kind from that of more mature individuals. All children develop through the same sequence of stages before achieving mature, rational thought." (Wood, 1988, p 37)

Vygotsky too was not in accord with some aspects of the work of Piaget and Bruner was uneasy with "the quietism of stage theories, quietism in the sense that the stages were simply something a child lived through until he had enough aliment to progress to the next one." (Bruner, 1983, p 143)

Some modification to the 'stage theory' is implicit in Flavell's observation that "Many of the major cognitive-developmental changes appear to be
qualitative rather than quantitative, at least at some level of analysis. Cognitive growth is gradual- perhaps very gradual- rather than abrupt." (Flavell, 1985, p 300) Vygotsky called into doubt the applicability of Piaget's findings to children in general, contending that the developmental uniformities established by Piaget applied only to the given milieu, under the conditions of Piaget's study.

However, Piaget's work is acknowledged universally in the impact of his theory on educational practice and the importance of his work to developmental psychology. He "revolutionised the study of child language and thought .... he demonstrated that the difference between child and adult thinking was qualitative' rather than quantitative' (Vygotsky, 1962, p 9). His position as the forerunner in observational analysis of the child's learning behaviours is undeniable. His later work was more closely aligned with that of Vygotsky who, it must be said, was familiar only with Piaget's first two publications and there were undoubted similarities in their theories of development. The major point of departure concerned their differing views on the nature of language and its effect on intellectual development. Piaget did not view language as central to the process of development. Piaget argued that language is a method of representation within which thought occurs, Vygotsky viewed language as 'social and communicative in both origin and intent' (Wood, 1988). For Vygotsky, language firstly served a social function, he considered that the cognitive and communicative functions later evolved from this.

Signs and words serve children first and foremost as a means of social contact with other people. the cognitive and communicative functions of language then become the basis of a new and superior form of activity in children. (Vygotsky, 1978, pp28-29)
To quote Bruner, "Vygotsky began, recall, with two independent"streams" of mental activity: a stream of thought and a stream of language. Thought early in life was in its own terms, whatever those might be. Language first became an instrument and then the medium of thought" (Bruner, 1983, p 158). Vygotsky and Bruner considered

...acquiring the means to communicate clearly is what creates cognitive and linguistic progress (which are viewed as two sides of the developmental coin). (Wood, 1988, p132.)

Vygotsky identified a 'prelinguistic phase in the development of thought and a pre-intellectual phase in the development of speech' (Vygotsky,1962, p41). In 'Thought and Language' he was very much concerned with the internalization of egocentric speech into inner speech and thought as a means whereby the two streams of speech and thought merged. Inner speech is speech for oneself and as such is different in structure to expressive speech, inner speech develops when the child is able to "think words" it is abbreviated to the point of being incomprehensible to any one else. The subject and verb are abandoned because the 'self' knows the subject, only the predicate is needed. According to Vygotsky's argument, egocentric speech gradually becomes more and more like inner speech in structure. Vygotsky considered egocentric speech to be transitional in the evolution from vocal to inner speech and that it fulfils an important role in development. He believed that egocentric speech became internalised and formed the basic structures of thinking and thus controls behaviour.

Thought development is determined by language, i.e. by the linguistic tools of thought and by the sociocultural experience of the child. (Vygotsky, 1962, p51)
Piaget's view was the opposite. "Piaget's theory predicts that the use and understanding of language is constrained by stages of intellectual development" (Wood, 1988, p 94). For Piaget suppression of egocentrism and the disappearance of egocentric speech was indicative of a different developmental stage.

Bruner looked at modes of representation as possible stages in development as an alternative to the sequential Piagetian stages.

Enactive representation, in effect is storing one's knowledge in the form of habits (as in riding a bike), iconic is storing in images; symbolic by means of a symbol system like language. (Bruner, 1983, p143)

Enactive representation may also be explained in terms of 'proceduralized knowledge' as proposed by Anderson

...procedural knowledge is more automatic learning and the operation of skills that are frequently practised... As we use the same knowledge over and over in a procedure, we lose our access to it and thus lose our ability to report it. (Anderson, 1980 pp224-225, cited in Carrucan 1991, p 45)

In summary, the three major theories I have considered here, all depart from the behaviourist based theories of learning. Vygotsky shared some of Piagets convictions, in particular an emphasis on activity as the basis for learning and for the development of thinking (Wood, 1988), but held different views on the relationship between speech and thought. Vygotsky of course, did not survive to reap the benefits of the amassed knowledge of subsequent research on child development but his general position is still tenable in the light of more recent work, some of which would have derived from his theoretical base.
Bruner shared Vygotsky's belief in the "importance of culture and cultural history in the formation of mind", but he also acknowledged the influence of biology and evolution as did Piaget. Bruner brought experience from his own research on adult cognition and had the benefit of the insights of both Piaget and Vygotsky on child development when he entered the field of intellectual development. He rejected the sequential stages of development which epitomise Piaget's theory and thus held the middle ground between the two (Wood, 1988, pp34-36). Piaget saw action and the operations constructed through activity as central to intellectual development. Vygotsky perceived the developmental origins of language and thought to be separate but argued that about the age of three language and non-verbal thought intersect to form the foundations for the 'development of verbal reasoning and self-regulation'. At this stage Vygotsky considered that language became the central instrument for intellectual development although he made it clear that thought is not subsumed in language but proceeds as non-verbal thinking (Wood, 1988, pp181-182). Thought is clothed in language but the right words have to be sought to fulfil the substance of the thought. Thought and language are intertwined but remain separate.

Implications of the literature

The theoretical insights developed by these researchers provided the core theory which framed and directed this study. The classroom context in which the study was located reflected many of the theoretical propositions which underpin their work. For example, consideration of the various propositions led to the development of the scaffolding techniques which
were aimed at supporting independent learning and encouraging the students to reach their potential in all aspects of the study. In exploring the computer, in composing text and in seeking support for their literacy learning they were encouraged to try themselves but assistance was available if needed. It seemed reasonable to assume that no set developmental sequence need be anticipated in light of recent re-appraisals of Piaget's developmental stages. The student's were not expected to reach any set goal but to set their own pace. They were effectively learning by doing and setting their own goals. As well as guiding the setting up of the context for the study, the work of these seminal thinkers also influenced the interpretation of the results.

Language Learning and the Acquisition of Literacy

Language

The theoretical principles developed by the work of cognitive psychologists referred to in the last section re-appear and in some cases have been extended by work being done in the language learning and acquisition of literacy field. Chomsky in some ways clarified the issues pertaining to 'theories of learning and language learning' in so far as he claimed that the separation of 'psychology' which is basically the study of behaviour and learning from 'linguistics' as the study of grammar (language) was artificial. Linguistics is simply that part of psychology which is concerned with one specific class of steady states, the cognitive structures that are employed in speaking and understanding. The study of language learning is concerned with the acquisition of such cognitive structures, and the study of behaviour is concerned with the ways in which they are put to use. It is self-defeating to construct a discipline that is concerned with use and attainment of some cognitive structure, but that excludes consideration of the structure itself. (Chomsky, 1975 pp160-161)
In the 1950's Chomsky gave a whole new dimension to the study of language learning. He proposed a theory of language which outlined the 'deep' and the 'surface' structures which constitute spoken language which was totally at variance with existing psychological theories of language learning. He argued that language cannot be viewed as vocal 'responses' to 'stimuli', but that language involves grammatical rules and that children are acquirers of language not learners who develop language by being taught and reinforced.

This was a radical shift from behaviourist principles. It posited a view of language as a generative process. It was a theory of the grammatical structure of language. Chomsky's theory of language acquisition presented a view of children as active learners who discover and use the rules in creating and generating utterances in the course of language development (Wood, 1988, p 97). Chomsky argued that as children often use forms which they would never hear from parents or others, such as 'I goed' then the proposition that conditioning and reinforcing takes place for every language item learned is spurious. The generative approach implied a shift "to the study of 'internalised language' and to an analysis of the systems of mental representations which enable us to use language", as opposed to the 'externalised language' view of traditional/structuralist linguistics and behavioural psychology. In his more recent work, Chomsky stated

The study of generative grammar shifted the focus of attention from actual or potential behaviour and the products of behaviour to the system of knowledge that underlies the use and understanding of language. (Chomsky, 1986, p.24 cited in Shorrocks, 1989 p. 144)
The modern view of language learning owes much to the changed attitudes
to language acquisition and research into language development which was
generated by the Chomskian revolution. It brought about a new theoretical
perspective on the processes of language acquisition and of the child as an
active learner who discovers rather than being 'taught'. Chomsky's work
relates to the theoretical assumptions of Vygotsky on language and thought.
Vygotsky viewed language as the pivot around which learning turns.

It is in word meaning that thought and speech unite into verbal thought...A word does
not refer to a single object but to a group or to a class of objects. Each word is therefore a
generalization. Generalization is a verbal act of thought and reflects reality in quite
another way than sensation and perception reflect it...There is every reason to suppose
that the qualitative distinction between sensation and thought is the presence in the
latter of a generalized reflection of reality, which is also the essence of word meaning;
and consequently that meaning is an act of thought in the full sense of the term. But at
the same time, meaning is an inalienable part of word as such, and thus it belongs in the
realm of language as much as in the realm of thought. (Vygotsky, 1962, p5)

In children's learning communication requires meaning 'i.e.
generalization- as much as signs' "the world of experience must be greatly
simplified and generalized before it can be translated into symbols." (Edward

...thought reflects conceptualised actuality. That is why certain thoughts cannot be
communicated to children even if they are familiar with the necessary words. The
adequately generalized concept that alone ensures full understanding may still be
lacking. Tolstoy in his educational writings, says that children often have difficulty in
learning a new word not because of its sound but because of the concept to which the word
refers. There is a word available nearly always when the concept has matured.
(Vygotsky, 1962, p7).

Vygotsky follows Tolstoy's argument 'What the child needs is a chance to
acquire new concepts and words from the general linguistic context.' and he
quotes:
When he has heard or read an unknown word in an otherwise comprehensible sentence, and another time in another sentence, he begins to have a hazy idea of the new concept; sooner or later he will...feel the need to use that word- and once he has used it the word and the concept are his. (Tolstoy, L. (1903), cited in Vygotsky, 1962, p 84)

Goodman reinforces this when he asserts

Language is learned in the context of its use. Word meanings are built in relationship to concepts; language facilitates learning but it is the conceptual development that creates the need for language. without that words are empty forms. so vocabulary is built in the course of language use including reading. (Goodman, 1984, p111)

Halliday too, views language as central to the learning process

...language is the only phenomenon that partakes in all the realms of human experience - natural, biological, social and so on." ...Today, not only do we think of language development as something that runs throughout education; we also use it to link school learning with that of the home- to bring together common sense knowledge and educational knowledge. (Halliday, 1986, pp7-8)

Halliday envisaged a general language-based theory of learning which would be a theory of "language and society: 'sociolinguistic in the deep sense of that term." When a child is learning how to mean, he/she is becoming a social being and a semiotic being, a communicator who is "learning to construe the system from text and text from the system." He expressed the view that

..the concept of language education, and of learning as primarily a linguistic process, will for as far ahead as we can see be the best way we have of understanding, and therefore of intervening in, the directions and practices of education. (Halliday, 1986, p 12)

The Social Context

The theme of language and language learning as social processes and the child as an active learner is the focus of the work of Harste, Woodward and Burke. Their research "shows that the interpretive rules of language use-even written language use- are acquired through social interactions at very early ages" (Harste, Woodward & Burke, 1984, p56).
Harste, Woodward, and Burke, suggest that a linguistic data pool provides interactive connections between all the elements of language. The central notions of this are:

1. What language users learn from a language encounter feeds a common pool of linguistic data which can be drawn upon in a subsequent language encounter;

2. Oral language encounters provide data for written language encounters and vice versa;

3. Growth in a given expression of language must be seen as a multi-lingual event; in reading, for example, hearing a set of directions read, encountering written language with others, listening to a book, talking about a newspaper article, or attempting to write one's own story, all support growth and development in literacy. (Harste, Woodward & Burke, 1984, p 210)

The work of Harste, Woodward and Burke reflects Smith's theoretical writings (1973, 1979, 1982). Smith discusses children's attempts to make sense of language by understanding the purpose of language. It is undeniable that children understand language before they are competent users of language. They do this by relating language to its context, by using the clues in the environment and by observation of events to understand the purpose of language and to determine what is meant. Smith argues children "are only concerned with the purposes to which language can be put" because it makes sense in their world. The child's striving to make sense of the events around him/herself, is the natural way to gain understanding of their world. In the same way, environmental print influences beginning reading and writing, children use the situations in which printed 'signs' occur to lead to possible meaning. They become aware that written language works in the same way as spoken language and has a purpose. Learning involves relating the new to that which is already known. (Smith, 1979).
All of these views of language learning mesh into an overall conception of language development as primarily a social event which evolves experientially and learners as active participants exploring their world of meaning. In Halliday's terminology "learning to construe the system from text and text from the system." Goodman (1984), and Harste, Burke and Woodward (1984), perceive the role of the learner as an active one, exploiting all aspects of the social context in the search for meaning.

**Literacy Acquisition**

The principles emerging from the research reviewed above are also evident in the more recent research into literacy acquisition, especially research into writing development.

Kemp, (1987) has suggested that "The acquisition of literacy requires the development of a cognitive process which must become functionally automatic if reading and writing are to be fully developed", he further explains that

...if cognitive competence is viewed as a trigger which is continuously self-repeating and the outcome of the resultant action is continuously self-sustaining... it supports the view that one learns to read by reading, to write by writing and to spell by reading and writing; and that these functions become interdependent and fluid because all elements of the literacy process stimulate and support other elements in an ever-widening cognitive mastery. (Kemp, 1987, p 25)

Scardamalia, however, points out that "handwriting, spelling, punctuation, word choice, syntax, textual connections, purpose, organization... must all be dealt with simultaneously" and says
For the skilled writer we may suppose that many aspects of writing are automated and that cognitive space-saving strategies make writing possible without inordinate demands on processing capacity. For the beginning writer, however, very little is automated and coping strategies are lacking. (Scardamalia, 1982, p 81).

Thus stressing the difficulties of beginning writers who lack automaticity and strategy development. Carrucan agrees "that a writer has a complex task and must retain and manipulate a considerable cognitive load." (Carrucan, 1991, pp 21-22) This is difficult for beginners and is evident in the lag time between language proficiency and writing proficiency.

The whole language approach to literacy maintains that language is learned holistically and not through isolated skill instruction. Cambourne has supported a holistic approach to literacy and a 'natural approach to writing', viewing the development of writing ability in much the same way as the child's development of language ability. In a study of young children using computers,

Piazza and Riggs (1984) suggest that kindergartners who are allowed to experiment at the keyboard actively explore language in ways that parallel their oral explorations of speech as well as ways that are computer specific. (Cochran-Smith, 1991, p 136)

Cambourne (1988) asserts that while learning to talk is seen as 'natural'

The same cannot be said for the written form of language...there are very few contexts in the real world where writing is the major medium of communication, where young learners can engage with it in much the same way that they can engage with demonstrations of the spoken form... The real world simply does not provide the conditions for learning to write that it provides for learning to talk...Thus when I use the phrase 'learning to read and write naturally' I'm really talking about simulating the natural conditions that we know work for learning to talk, so that they're available for the learning of reading and writing. (Cambourne, 1988 pp 41-42)

Conditions for natural learning include immersion in print and literacy events, acceptance of students' temporary spelling, demonstrations of
literacy in the context of use by experienced others, opportunities for learners to engage in literacy events and the expectation of success in literacy (Cambourne 1984). In Australia "every state department of education has produced curriculum documents which claim at least a theoretical affinity with a "whole language philosophy". ( Cambourne, 1987a p.2., cited in Carrucan, 1991, pp23 - 24).

Learning to Spell

The principles emerging in the writing research reviewed above become more apparent when the research focus shifts to the acquisition of spelling. Calkins proposed in her research "that children can learn to write just as they learn to talk". When a young child makes an approximation of a word, it is applauded, there is no reason to doubt that eventually, approximation will become the actual spoken word. In writing, they can learn in much the same way, moving closer to conventional spelling as they move from 'enactive to iconic to symbolic' representation. Calkins found that during the course of her study of writing development, the students "were pushing beyond their developmental level" exhibiting changes in writing which might be expected of older children. She commented "Teaching- in the richest sense of the word-interacts with development and changes it." (Calkins, 1983, p. 60) She cited Vygotsky:

What the child does in co-operation today he can do alone tomorrow. Therefore the only good kind of instruction is that which marches ahead of development and leads it; it must be aimed not so much at the ripe as at the ripening functions... Instruction usually precedes development. (Vygotsky, 1962, pp101, 104)

Graves and his fellow researchers Calkins and Sowers documented the progress of children's writing from invented spelling through to full spelling and identified five general stages in the process. They found that as
contact with standard spelling occurred, modifications to spelling followed as illustrated in the example below from Graves, (1983, pp184-185).

| STAGE I- | Use of initial consonant G | (GRASS) |
| STAGE II- | Initial and final consonant GS | (GRASS) |
| STAGE III- | Initial, final and interior consonant GRS | (GRASS) |
| STAGE IV- | Initial, final and interior GRES consonants, and vowel placeholder. Vowel is incorrect but in correct position. | (GRASS) |
| STAGE V- | Child has full spelling of the word, with final components from visual memory systems and better vowel discrimination | GRASS |

Children progress from invented forms to approximations of adult language forms, whether in the form of speech, drawing or writing and in the process discover the symbolism which enables the transmission of meaning. Clay (1979), found that children experiment with letters (signs) in a flexible manner and errors may often be part of the process of learning. When new dimensions are explored, previously mastered processes may be put aside and some apparent regression may occur. As children start to gain control of spoken language they produce sounds which approximate the words they are attempting to say. Their efforts at pronunciation are applauded not corrected. Over time closer and closer approximations lead to eventual control of the conventional form.
As R.D Walshe says of invented spelling

Children don't need to be taught to read before we allow them to write. They seem to know this instinctively. If we ask them to 'Write!' before they are given any writing instruction, they gravely do something with crayon, pen or pencil, even if it appears to be 'scribble' or if it is a drawing without any attempt at words...Children tend to begin their invented spelling by writing only the first consonant they hear in a word, ... later they might add an end consonant and later still a vowel. (Walshe, 1981. p 123)

We should accept these beginnings, Graves, said "Invented spelling was the common practice of children where we conducted our research." (Graves, 1983, p 187.)

Cambourne & Turbill cite the findings of a number of researchers regarding the use of temporary spelling by young children (Cambourne & Turbill prefer the term 'temporary spelling') and report

... when young learners are given opportunity and encouragement to create texts, they will attempt to create meaning using unconventional spellings (temporary spelling). The findings also suggest that as these children continue to write using their temporary or invented spellings, they gradually proceed through a series of approximations to the conventional forms of spelling. (Cambourne & Turbill. 1987, p 24)

As demonstrated by the studies mentioned above, writing can be encouraged in much the same way, 'Kds Cn rit snr thn we thingk' as Susan Sowers so clearly showed in her work. (Sowers, 1981).

In considering the ways that children do make the transition to conventional spelling, Harste, Burke & Woodward, (1984, p 96) suggest that there are three sound to letter strategies employed by beginning writers "(1) spelling the way it sounds; (2) spelling the way it articulates and (3) spelling the way it sounds out." They suggest that more than one of these strategies may be involved in the spelling of a word. They also point out a fourth
strategy "the letter name strategy" where the name of the letter coincides with a word sound such as R for "our".

Holdaway also looked to initial language learning behaviour for a model of literacy learning in terms of a developmental model. He developed a program of literacy learning in early childhood based on positive interaction, not negative correction. He advocated teaching reading skills in context, immersion in print, and letter sound correspondences through experience with letter-sound relationships. (Holdaway, 1979)

Frank Smith asserts "By writing what I think I know, I develop what I potentially knew. Writing does more than reflect underlying thought, it liberates and develops it." (Smith, 1982, p33) Smith considers invented spelling as a natural outcome of "an overrated principle of our written language-that spelling represents the sounds of speech... Learning to spell takes time; it begins with misspellings. Children who write only the words they know how to spell end up writing (and knowing how to spell) very few words indeed." (Smith, 1982, pl85)

The approach to the teaching of writing has changed considerably in recent years, the processes of writing have become a focus of classroom practice rather than concern with the final product. One approach to the teaching of writing owes a great deal to the research of Graves and his "process-conference" method of helping children to gain control of their writing. The influence of Graves has spread widely through the education systems of the English speaking world. Graves in his 'Address to the Third International
Conference on the Teaching of English, Sydney, Aust. 19 Aug, 1980 - Patterns of Child Control of the Writing Process' said:

Children show us how they seek to control writing when they go about composing. They show us their stumbling blocks and the orders in which they grow in the writing process. They don't show with any one behaviour, nor in an antiseptic laboratory setting. Rather they show us their growth patterns over a long period of time and in the setting where they normally function, the classroom. (in Walshe, 1981, p 17)

Graves and his co-researchers undertook a study of children's writing over the first four years of schooling using recording of behaviours during writing, interviews and analysis of children's writing, gathering information whilst avoiding interference with the process. In his beliefs about the inefficacy of contrived laboratory research settings for educational enquiry Graves has brought about a quiet revolution in educational research. Graves was the pioneer of the use of ethnographic studies of writing, he examined the writing process in the classroom and became 'The Researcher who Watches Children Write' . (R.D Walshe, Ed., 1981-84).

The so called "process" approach to writing has become a widely accepted method for literacy learning "process-oriented classrooms are highly structured, organised and robust learning settings" (Cambourne & Turbill, 1987, p 66). Process writing methods give children an environment conducive to learning, autonomy in their choice of topics, responsibility for editing and improving their written drafts in a supportive but not a directive mode.
Graves describes the writing process as 'discovering by doing'

"Process" refers to everything a person does from the time he first contemplates the topic to the final moment when he completes the paper. Students can be lectured on the process, but they still only know process by actually doing the writing, making words fulfil their intentions. (Graves, 1983, p.250)

**Special Education /Intellectual Disability**

Can the theoretical principles emerging from the research described above be applied to children outside the educational mainstream (children who have been classified as falling within the special education domain)? These questions beg several others which need to be addressed including what are the current views concerning learning, language and children within the special education domain? Currently there is a vigorous debate and dialogue about these questions in the special education literature. In what follows the issues for this study which emerge from this debate will be addressed.

The term 'special needs' may be considered inappropriate in that it can be argued that all students share the same needs (Goldenberg, Russell, Carter, Stokes, Sylvester & Kelman, (1984). What is 'special' is the need to provide some students with special adaptations or support to help them overcome physical, cognitive or social barriers to learning. Goldenberg stresses the need to *normalise experience* for handicapped individuals rather than to normalise their behaviour. The use of the computer can remove some of the barriers for, (for want of a better term)'special needs' students. (Goldenberg, 1979.)
In an article in Newsweek, April 17, 1989, Barbara Kantrowitz and Pat Wingert explored recent changes in approaches to education. Teachers are turning to programs 'designed to fit the child' in what educators call "developmentally appropriate practice" - a curriculum based on what scientists know about how young children learn."

For many years, in Australia and overseas the education of children with special needs was set aside from that of mainstream education, more recently there has been a push internationally toward integration of these students into the regular school systems. The view now is that special education should not be restricted to special schools using different teaching methods but that a continuum of provision in types of school, curriculum and instruction can best provide for the needs of all students. Since the Warnock Report (1978) and the Education Act (1981), in the UK there has been an emphasis on the provision of a variety of educational facilities to meet the needs of all students. In the US, following Public Law 94-142 the requirement for a 'free appropriate public education' for all children led to a proliferation of 'special education programs' which focussed on 'special education' and related services. According to Kaufman, et. al. what is needed is "a whole child perspective in order to achieve better educational and postschool results for children with disabilities." (Kaufman, Kameenui, Birman and Danielson, 1990)

Students with special educational needs have been and continue to be assessed for classification by the use of tests, which are increasingly being questioned.
In the United States, controversies regarding the validity of existing tests, test bias, overrepresentation of ethnic and linguistic minority students in special education, usefulness of test data for instructional decisions, and other factors have led many to question current testing practices. (Gallimore, Tharp & Rueda, 1989, p 56)

The use of standardised norm-referenced tests or curriculum based assessment is the accepted practice, however, both of these focus on the individual-developmental level or unassisted level. It is a measure of what the child can do alone, it does not take into account Vygotsky's zone of proximal development. If a student assessed in this way could achieve much more with some assistance then placement based on conventional testing can lead to underachievement (Gallimore, Tharp, and Rueda, 1989, pp 56-57). There are many other questions which could be raised regarding the usefulness of standardised tests but it is not possible to consider those here.

During the last two decades the influence of behavioural psychology had great impact on educational practice and theory in the field of special education. There is currently some serious questioning of the validity of the principles underpinning behavioural theory, and thus applicability to Special Education. Sugden contends that

When feedback is given to the child, from the behavioural point of view it is seen as reinforcing rather than informing. The child is still viewed as a passive recipient of information rather than an active seeker who reconstructs what the environment offers. (Sugden, 1989 p. 20).

The cognitive perspective views learning processes as crucial in the learning/teaching situation (Sugden, 1989). In the 1980's the cognitive/learning strategies model emerged with a perspective which regarded the teaching of strategy behaviours necessary to perform academic
tasks as the main method of instruction. This model used 'direct instruction 
in strategies used by successful school learners; also use of principles of 
reinforcement, particularly self-management and self talk' (Poplin, 1988). 
Poplin looked at the different theoretical models of instruction for learning 
disabled students , to which she gave a timeline and an overview, indicating 
the reductionist orientation of all models, The Medical Model (1950's), The 
Psychological Process Model (1960's) The Behavioural Model (1970's) and 
the Cognitive Learning Strategies Model (1980's). (See Table 2) 
Poplin states that classroom practice is usually a mix of all four models and 
suggests that the timelines of the models is more representative of events in 
the professional literature than of classroom practice. The recent debate 
concerning 'Paradigm Shift' in Learning Disabilities concerns the failure of 
these models to achieve generalization and maintenance of learned skills 
for learning disabled students. Poplin believes that the reductionist 
paradigm overlays all the models and the reductionist nature of the 
methodologies is at fault. She states 

The methods we currently apply in learning disabilities are all examples of 
erroneously believing that a complex whole such as human learning or learning 
problems can be broken into its component parts (e.g., neural processes, hypothetical 
psychological processes, prerequisite academic skills, observable academic and social 
behaviours, and cognitive or learning strategies). (Poplin, 1988, p394)

She concludes 

...the ever increasing body of research and theory suggests that operating on these 
reductionist paradigmatic values has not served (and will not serve) our students or our 
field well. We are not having a great deal more success than the early medical model 
advocates... Perhaps it is time to begin to shed the reductionist theory, measurement, 
instructional methodologies, and organizational structures we have built upon our 
medical model origins, and to turn our sights toward a nonreductionist theory of 
learning, teaching, and growth. (Poplin, 1988, p 398)

(The table below is taken from Poplin, 1988, TABLE 1 p 391.)
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<tr>
<td><strong>Emphasis</strong></td>
<td>Neurological pathways</td>
<td>Prerequisite skills for academic success</td>
<td>Academic product or consequent behaviour</td>
<td>Information processing and metacognition necessary for academic success</td>
</tr>
<tr>
<td><strong>Etiology</strong></td>
<td>Brain damage or disfunction</td>
<td>Minimal neurological dysfunction</td>
<td>Lack of learned behaviours</td>
<td>Insufficient strategies or study skills with which to process information necessary for school success</td>
</tr>
<tr>
<td><strong>Diagnosis</strong></td>
<td>Largely neurological</td>
<td>Soft neurological signs, psychological process testing; some intelligence and academic tests, or modality frame of reference</td>
<td>Discrepancy between IQ and academic achievement, criterion-referenced tests, and observation of specific academic and social school tasks</td>
<td>Discrepancy between IQ and academic achievement, with cognitive skills tests and/or observation of specific strategies</td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
<td>Academic assessment, largely anecdotal case studies</td>
<td>Psychological process; some basic academic skills</td>
<td>Testing of student behaviour against task analysis of skills, examination of reinforcement contingencies</td>
<td>Testing of student behaviour and processing against known cognitive and/or learning strategies used by successful learners, often task analyzed</td>
</tr>
<tr>
<td><strong>Instruction/treatment</strong></td>
<td>Extremely structured, clutter-free environment; motoric and other neurological training; some basic skills emphasis; some medication</td>
<td>Psychological or psycholinguistic training with less emphasis on actual academic skills; medication, sensory integration, and/or modality training</td>
<td>Direct instruction using task analysis of skills (behaviours) and application of reinforcement principles</td>
<td>Direct instruction in strategies used by successful school learners; also use of principles of reinforcement, particularly self-management and self talk</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>Function in community</td>
<td>Function in school; less community emphasis</td>
<td>Almost exclusively school-related goals, some social but primarily academic mainstream</td>
<td>Almost exclusively school-related goals; some social but primarily academic mainstream</td>
</tr>
<tr>
<td><strong>Some major figures</strong></td>
<td>Werner, Strauss, Lehtinin, Cruikshank</td>
<td>Kirk, Frostig, Minkoff, Kephart, Barsch, Wepman</td>
<td>Lovitt, Carnine, Jenkins, Haring, Bateman</td>
<td>Torgeson, Hallahan, Deshler, Schumaker, Alley, Meichenbaum, Feuerstein, Wong</td>
</tr>
</tbody>
</table>
In a follow up article Poplin examined the possibilities in the 'Holistic/Constructivist Principles of the Teaching/Learning Process' and the changes in educational theory which had led to this new paradigm. She cited Piaget's constructivist theories of learning; Whitehead's (1929) work on process thought; Levi-Strauss's (1963) structuralism; Polanyi's (Polanyi & Proesch, 1975) work on meaning and knowledge; Smith (1982, 1986a, 1986b) on reading and writing; Freire (1970, 1985) on education as transformation; Holdaway (1984) on literacy; Glaser and Strauss (1967) on grounded theory; and many others as examples of people advocating nonreductionist ways of teaching and learning. Poplin tentatively names the new paradigm and theory 'holistic constructivism' and supports such a paradigm shift. She asserts

One of the major tenets of constructivist views of learning is that in order to learn new information, learners must be actively involved in the learning process. (Poplin, 1988, p 411)

Poplins' articles drew responses from Reid, Forness, and Kimball and Heron (1988).

Reid based her response on a review of Piaget's later work. Piaget himself became dissatisfied with his theory of developmental stages so eagerly adopted in educational practice (because of their easy assimilation into reductionist views). He turned to developing a biological model.

Piaget (1971,1977) regarded cognitive development as the extension of the biological organism into its environment with the processes of assimilation and adaptation equally relevant to intellectual and physiological growth...Because living systems are inherently active (rather than reactive) and growth oriented, Piaget described the course of development as a dialectical and augmentative spiral, a description of human functioning compatible with the holistic view. (Reid, 1988, p 417)
Reid (1988, p 417) "...explored the implications, compatible with the position Poplin articulates here, of the new model for education."

She discussed
"the shift from reductionist or stimulus-response explanations of learning to the assimilative or response-stimulus explanation fundamental to dialectical theories -and the holistic paradigm" in terms of the active organism as "the most relevant aspect of holistic thinking, because it has profound implications for teaching." (Reid, 1988, p 417)
She supported the ideas embraced by the holistic/constructivist paradigm. However, Reid believed evolution through the 'education of educators' might be more effective than 'revolution' in Kuhn's terms of scientific revolution. Reid stated

As educators of educators, however, we need to explore ways to bridge the gap between the mechanistic image of learners currently in vogue (even in our best conceptions), and the more realistic, more dynamic view of the learner as a living system- a reality esconced in the holistic perspective. (Reid, 1988, P 419)

Forness supports the view that "The reductionist fervour of the past three or four decades ...has largely failed to produce effective remedial approaches. There may be considerable potential, therefore, in a shift toward a more holistic or constructivist view." and is in sympathy "with her essential message that traditional LD paradigms are no longer viable" (Forness, 1988 p 423). Kimball and Heron (1988, p 425) refuted the proposition that behavioural principles had failed to meet the needs of special education. Their response was "A behavioural response... since Poplin asserts that the reductionist model is best represented by the behavioural paradigm." In defence of the behaviourist methodology Kimball and Heron state that
...the behavioural paradigm has provided a validated and documented methodology with which to continue the investigation of the relationships among the individual, the environment and learning. (Kimball & Heron, 1988, p 427)

There is strong opposition within the field of special education to the views expounded by Poplin, the entrenched view is conservative and unwilling to accept change. Reid, anticipating this reluctance to change proposes that change can be achieved through education of educators.

Gallagher & Wansart, devised a model of the development of knowledge that is holistic and relational, in terms of Piaget's view that the development of knowledge is always a relational process. Partially based on Piaget's research and theory and his later work on a "theory of knowing with built-in self-regulation analogous to living systems, which provides the base for the acquisition of new knowledge through the constant interaction between openness (potentially new understandings) and stability (previous network of knowledge)." The Assimilative Base Model of Strategy-Knowledge Interactions which "capitalised on the mutual interactions among the learners representations, strategies and automatic skills, and the task, as well as emphasizing the social nature of learning." They characterise the model as being focussed "on the process involved in the acquisition of knowledge exemplified by Piaget's later and less well known work rather than the old emphasis upon stages and logical models". They observed that "The same interactions are seen in collaborative approaches to writing instruction... Graves (1983) was cited. (Gallagher & Wansart, 1991, pp31-38)

Evidence of discontent with some existing practice in special education is also seen in the recent articles on Cognitive Strategy Instruction which link
to the major principles of constructivism. Attempts to take different approaches to instruction and new models for implementing instructional strategies are an indication of change.

Harris & Pressley (1991) defend the precepts of 'good cognitive strategy instruction' in light of criticism that "cognitive strategy instruction precludes active construction of knowledge, that constructivism and the practice of cognitive strategy instruction are mutually incompatible" (Poplin, 1988). Harris & Pressley refute the allegations of Poplin, Kronick and others that strategy instruction is little more than "telling children what to do and expecting them to memorize and reproduce the steps of a strategy procedure exactly." They claim that "Such conceptualizations and descriptions of cognitive strategy instruction are inaccurate." They further claim that

General recognition of the active role of the learner has been accompanied by the integration of previously diverse theories of learning and development...and has set the stage for the development of educational interventions that allow children to construct accurate knowledge and powerful procedures and express their belief "that cognitive strategy instruction is one such intervention." (Harris & Pressley, 1991, p 393)

Reid and Stone looked at several studies of cognitive instruction in an attempt to define the "learning principles that undergird the most productive interventions." They described two learning mechanisms "prolepsis and reflective abstraction, derived respectively from Vygotskian and Piagetian accounts of development." In short:
Prolepsis, derived from an analysis of the developmental theory of Vygotsky (1987) is concerned with the social influences on children's learning. It is an attempt to highlight the communicational dynamics that assist children in adopting new perspectives on the objects and events in their environments. Reflective abstraction, a construct from Piaget's developmental epistemology, on the other hand, helps us to understand both how a child raises himself to new levels of understanding and why not all experience, whether communicational or physical, leads to new learning. (Reid & Stone, 1991, p 9)

Prolepsis is a term derived from rhetorical theory that "refers to a communication that leaves implicit some information that is provided subsequently." In such learning adults lead children to construct new understandings from their existing level of understanding through interaction. "Vygotsky's views on the role of social experience in shaping learning and development, frequently through the mechanism of proleptic instruction, point to the importance of a careful analysis of the social and communicational dynamics within instructional settings." (Reid & Stone, 1991, p 11). Four generalizations were raised:

First, development emerges from children's active involvement in learning. Second, the truly formative learning experiences are social in nature. Whether or not another individual is present, children develop via what they learn from social others or socially defined objects and via their use of the symbolic tools of their culture. Third, to be maximally beneficial, social interactions must take place within a region of optimal mismatch in relation to the child's capabilities, that is, within the zone of proximal development. Finally, these interactions can often be characterised as involving a process of proleptic instruction in which adults operate as if children share the adult understanding, and, as a result, the children construct that perspective. (Reid & Stone, 1991 p 11)

Reflective abstraction, according to Reid and Stone "might be considered the mechanism by which the child in Vygotsky's terms, "raises himself"...Effective imitation is not reproducing an action; it is understanding an action. Understanding is a process that requires observation, projection or internalization, and organization (i.e. reflective abstraction)." They summarise the two constructs as "Prolepsis is a
mechanism that explains how communication becomes a bridge spanning two person's knowledge in that one must construct the message of the other. Reflective abstraction describes the bootstrapping process the individual goes through to interpret and organize the message." Reid and Stone considered that the two constructs to be 'complimentary and compatible' despite a number of points of incompatibility in the respective theories of Vygotsky and Piaget. They express the view that the theories of learning of Vygotsky and Piaget can illuminate the mechanisms operating in effective cognitive instruction. (Reid & Stone, 1991, pp 15-18)

The key word that emerges from the debate on cognitive instruction appears to be 'effective'. It appears from the many criticisms of the strategy that appear in the literature that sometimes the strategy may in practice be reduced to a level at which it is not effective. Where the teacher is in control and 'managing' and the learner is passive, working under instruction on skills and strategies determined by others.

This recent and ongoing debate stemming from articles by Poplin, Reid, Forness, and Kimball & Heron signals the possibility of new views challenging the established methodologies. This may offer a more open approach which might allow students more opportunities to engage in 'effective learning experience'. It heralds a possible change in direction and a preparation for a paradigm shift in special education, although as Forness argues the new direction "however also contains the inherent difficulty that holistic/ constructivism faces: It must demonstrate that it is an effective paradigm." (Forness, 1988, p 423) This evidence of change in the overall assumptions and theories in special education is relevant to this study as the
precepts emerging from it are more aligned with the grounded theory emerging from the data than those of the previously dominant behaviourist paradigm.

**Computers and Writing**

The advent of computer technology has brought a potential avenue for the development of writing using word processing in the classroom. Opinions vary on the efficacy of computer use in schools. Many regard the use of the computer for drill and practice as 'a child minding facility' however, the mode of implementing computer use determines its value to the learner. Papert (1980) was one of the first people to recognise the potential for the use of computers in education. He believed that computers should be used in ways that allow children to exercise self-direction. He viewed the introduction of word processing in classrooms as highly motivating to young writers, allowing them to generate texts and revise and modify without the disincentive of having to tediously rewrite whole texts. Papert, in applying the Piagetian learning principles of learning without being taught (as in learning to speak) to the use of computers stated

We must ask why some learning takes place so early and spontaneously while some is delayed may years or does not happen at all without deliberately imposed formal instruction. If we really look at the "child as builder" we are on our way to the answer. All builders need materials to build with. Where I am at variance with Piaget is in the role I attribute to the surrounding culture as the source of these materials. In some cases the culture supplies them in abundance... But in many cases where Piaget would explain the slower development of a particular concept by its greater complexity or formality, I see the critical factor as the relative poverty of the culture in those materials that would make the concept simple and concrete. (Papert, 1980 p. 7).
This is congruent with Cambourne's contention that if the relevant conditions for 'natural learning' are simulated in the environment, (immersion in print and availability of models) then writing and reading can be promoted in a similar way to talking.

Examples of research which supports the idea of using computers in the educational context are discussed below.

Macarthur, et. al. examined the effects of computer assisted instruction (CAI) for spelling with learning disabled students. They claim that most research on CAI has been carried out in computer labs, whereas the

...most common pattern of microcomputer use in elementary and special education classes is one computer in a classroom...there have been few experimental studies that systematically investigated the outcomes of micro-computer based instruction in classroom settings, either in special education or in regular education. (Macarthur, Haynes, Malouf, Harris, & Owings, 1990, p 312)

They also claim that computers are most often used to provide independent drill-and-practice in both elementary and special education settings. They found that CAI had a positive impact on the task engagement of learning handicapped students and stated that other studies had reported high rates of engaged time for students using computers. (Macarthur, Haynes, Malouf, Harris & Owings, 1990)

There is emerging evidence that computer technology can not only be used in ways that are conducive to learning beyond the drill and practice level, but that it can be extremely engaging for most children.

Morrocco and Neuman reported the accessibility of word processing in a study with learning disabled students which made a comparison of using pencil and paper and the computer as a writing tool. One student was not
fully engaged in the given task of expanding a sentence, he rested his head on his hands. The teacher reached over and typed "Sam will be rested in class by", the student sat up, read the message and completed the sentence by typing "by sleeping on the job." The teacher followed by typing "Sam is trying to get the teacher's attention by", he quickly added "sleeping." The teacher then added "Sam will get the teacher's approval by", the student added "working all day like always", now fully engaged (Morrocco & Neumann, 1986, p 243). This episode serves to highlight the visible character of the word processor, the teacher probably would not have entered into this interchange with pencil and paper. Morrocco and Neuman commented "As a permeable writing environment, word processors create possibilities for teacher-child interactions which would be intrusive if the child were writing with pencil" (Morrocco & Neuman, 1986, p247).

The process based approach to writing previously discussed in the work of Graves and his associates (Graves, 1983, Calkins, 1986) lends itself very well to computer based application. The computer displays writing on screen, making it accessible to student and teacher (as noted above), so that interaction can easily be entered into between teacher and student or student and peers.

Daiute's (1985b) work supports this. In a number of studies he found children responded well to writing on the computer, finding it easier because there is no need to recopy to correct errors. Also they remained with the writing task for longer periods and wrote more. There seems to be a widely held view that spelling checkers and text editors should be avoided for beginning writers.
It is suggested by Montague that

...it may be best to virtually ignore errors in mechanics and spelling in kindergarten and early first grade or until children have made the transition from speech to writing and internalized the idea of writing. (Montague, 1990, p 11)

In studies of writing skills of students with learning disabilities, Morrocco and Neuman (1986) found students were more willing to take risks and persevere with writing when using a word processor. They also stressed the value of the interactive process which allowed teachers access to students writing processes. They maintained that the visibility and accessibility of computer writing encouraged spontaneous and frequent interaction and discussion among students and teachers. This was clearly demonstrated during the course of this study. Numerous instances of interaction with peers and teacher were observed. Students invited the teacher to come and look at their work. They discussed their texts and read from the screen. Peers made comments and suggestions.

As computer assisted composing (CAC) is coming into use in schools, the use of word processing as a natural partner for the process approach to writing is becoming clear. As research begins to validate the effectiveness of word processing and adjunct computer writing tools...The pairing of CAC with writing process instruction promotes use of cognitive and metacognitive strategies and also improve the quality and quantity of writing. (Montague, 1990, p17)

Research in this area also provides information on instructional practices which benefit writers of different ages and ability levels. (Montague, 1990)
Morrocco, (1987) studied teachers using word processing for writing instruction with mainstreamed, learning disabled fourth graders in a resource room setting over a 2-year period. She found that procedural instruction aimed at developing generative structures and frameworks throughout the writing process was more effective in enabling children to complete drafts and develop ideas than were substantive or direct skills instruction. Teachers subsequently learned to increase procedural instruction and to offer oral prompts to help children think like writers. (Cochran-Smith, 1991, p133)

Macarthur and Malouf's work supports the use of computers in classrooms. They conducted case studies of four special education teachers who were using computers in class to assess their beliefs, plans and decisions about computer instruction. They found that all or nearly all expressed beliefs about the positive effect of computers which included increased motivation, and improved self esteem for students. It is significant that three of the teachers felt that developing self-esteem and compensating for their disabilities were important goals which computers could help the students to achieve. The major applications used were word processing and drill and practice programs. The word processing was integrated with the overall writing instruction by three of the teachers, the other one used it to produce error free copies after editing by the teacher. One teacher was more concerned with fluency and motivation and allowed students to choose their topics, praised their work and required few corrections. (Macarthur & Malouf, 1991, pp 44-72.)

**Word Processors and cognition**

The Special Education Microelectronics Resource Centres in the UK developed a 'Core Library' of programs for special education which evolved into an approach to using the microcomputer in the classroom. Teachers in special units and schools are encouraged to use these programs. In one unit
a supportive word-processor 'Prompt' was used. This program incorporates the use of a conventional keyboard for word processing with an additional facility for input of whole words, phrases and sentences at a single touch from an overlay keyboard. The students' own vocabulary could be recorded for use with this. Some surprising gains in volume and complexity of written work was observed soon after the introduction of the system. The gains carried over into conventional handwriting from the computer based work. (Dyke, R.G., 1987)

Word processing may enable students to effect transfer of concepts as students interact with the computer and recognise that information in the environment can be transferred to the computer and that what they do on the computer has relevance for other activities. Goldenberg, Russell & Carter examined a complex language learning environment which was greatly assisted by use of a computer. A non-English speaking refugee, adopted by an American family was assisted in assimilating knowledge through computer skill games which eventually led to language learning as a spin off from problem solving activities. As her English improved her teacher introduced the use of Storymaker and Textman, programs which present a series of story parts which can be selected and Storymaker allowed addition of the students' own story parts. This was seen to encourage language development and eventually word processing was introduced, initially using Logo generated sentences to form text. Transfer had definitely played a part in the progression from skill game to text generation "without any mindful abstracting of principles". (Goldenberg, Russell & Carter, 1984, pp 60-63.)
A microcomputer demonstration project involving learning disabled students was carried out by the Department of Special Education at the Ontario Institute for Studies in Education (OISE) and the staff and students of a school for Learning Disabled Children in Ontario. They reported

Because learning disabled students have special difficulties with the printed word, word processors were the ideal cognitive aids for them. In some of the most dramatic cases, students who reportedly had never written a composition of any kind before, wrote their first story using the word processing capabilities of the microcomputer... Teacher reports indicated that on-task time for this activity, which at best ranged from 5 to 20 minutes in its traditional paper and pencil mode, increased in many cases to 40 minutes and more using the computer. Students not only added to the length and the quality of their compositions in terms of organisation and content, but they also voluntarily engaged in the writing process more frequently. (Lindsay & Marini, 1987, pp 131-144)

The reasons for this were related to the difficulties experienced by these students in poor handwriting and spelling skills which resulted in poor products and resulted in poor self image. With the computer these difficulties can be overcome, clean printed copy and the facility to correct errors allows the production of better work and thus provides motivation to write, an activity which many previously avoided. The results of the project which included programming and drill and practice showed that the computer is most effective for these students when it can be used to "assist in carrying out some cognitive task...word processors were the ideal cognitive aids for them." What is relevant to this study is the finding that

...microcomputers can play a valuable role in the development of cognitive and social skills in learning disabled students... Perhaps the microcomputer can help provide the learning disabled student an opportunity to learn not with frustration, not with humiliation but with enthusiasm, motivation and, most importantly, with dignity. (Lindsay & Marini, 1987 pp 131-144)
Computers as a writing tool

There are criticisms of the use of computers for word processing and more research is certainly needed to assess the effects on literacy and language programs. Porter, (1988) reported the concern of some teachers that computers are too abstract for young children, who according to learning theory need a rich variety of concrete experiences. However, she observed:

One has only to watch a two or three year old at a keyboard... to see the obvious delight that manipulating the keys brings. They attack the keys with great enthusiasm, often with the open hand in much the same way as you have probably observed them at the piano. With the computer, that soon passes when they come to realise that by pressing one or two specific keys something "happens" on the screen. (Porter, 1988, pp 17-19.)

So independent learning can be seen to take place. However, Porter stresses that knowledge concerning computers and young children is limited and needs further research.

It was the intent of this study to allow the opportunity for independent learning as students explored the functions of the computer and applied their knowledge for the purpose of writing with the computer. I have no wish to enter the debate on the merits of teaching keyboarding skills, some researchers feel this is important, others do not. I believe that trying to teach keyboarding skills before starting this research program would have been counter-productive. The students would have been subjected to demands on memory which would have interfered with the development of strategies for the composing process which was an important element of the study. By allowing the students to explore the keyboard it was hoped that they would discover computer functions and letter recognition would improve. Thus they would 'learning by doing, - constructing reality'.
Studies by Ferguson (1986) and Crozier (1986) supported this view. Ferguson studied the use of the computer for writing with pre-school children. He recommended that

...students be given all the freedom they require to explore the computer and be allowed to use their own problem solving strategies to do so." he reported the implications from his study "is that students who write freely and explore written language themselves discover the inherent rules of writing. This supports the notion stated by many educators that only by writing can we learn to write. (Ferguson, 1986, p.190., cited in Carrucan, 1991, p 40.)

Crozier made the point that

... spelling is reinforced by the word processor, because the writer not only recalls the word aurally, but then has to touch the letters to write it hence reinforcing the spelling visually...(This is also an argument why touch typing is educationally not important to word processing because there is no conscious touching of letters by a touch typist.) (Crozier, 1986, p102.)

Carrucan cited the positive findings of a study by Riel(1985) which reported improvement in quality and quantity of the writing of elementary school children when using the computer as a writing tool. He also mentioned a study by Kleiman & Humphrey (1982) which reported positive reactions to word processing by disabled children. Many of these students who would not write with pencil or pen became interested writers when using the computer. (Carrucan, 1991, p 30.)

Outhred reported increased self esteem among children with learning disabilities when using word processing for writing during a study at Macquarie University. The children exhibited greater confidence, spelling improved and longer stories were produced. (Outhred, 1989)
Using the computer for writing may help to overcome some of the difficulties experienced by young children learning to write. First attempts at revision are usually made by deletions and insertions rather than changes to syntax structure or meaning. (Crozier, 1986, p 101). The editing behaviour of the participants would form a part of the whole context of their literacy learning and therefore would be considered during the project.

From the review of the literature it appears that children are highly motivated when writing with the computer. A number of studies report positive gains for learning disabled students using word processing programs. The method of allowing students to explore the computer used in this study has been advocated in other studies. The cognitive gains reported by some researchers has been noted here and is explicated in the data. This longitudinal study allowed observation of changes in student behaviours which occurred over an extended period of time. Other studies of children’s writing using a word processor, in particular those carried out with students labelled as ‘learning disabled’ have, with few exceptions, been over a limited period of time. Thus information on the influence of computers in this field is not very comprehensive. This study may provide further insights into the effects of long term use of the computer on literacy learning.

The Issues and Influences Drawn from the Literature and how they impacted on and shaped the study

The Context of Learning

The theoretical tenets which have emerged from the literature show a clear concern with the processes of learning and cognitive development and a conviction that sociocultural conditions play an important role in the
learning situation. Vygotsky and Bruner both argued that social experience has a profound effect on mental development and learning. The profound implications of the theories of development of Vygotsky and Bruner, and of Piaget for learning theory and the consequent implications for literacy learning are apparent. The focus of attention on processes of learning, and the importance of language in cognitive development has been a major factor in determining the direction of this study. For Vygotsky writing is a separate linguistic function, it is not speech written down, it differs in structure and mode of functioning.

Even its minimal development requires a high level of abstraction... In learning to write, the child must disengage himself from the sensory aspect of speech and replace words by images of words. (Vygotsky, 1962, p 98).

Thus the very act of writing is evidence of abstract thinking. Most of the students in this study progressed from minimal writing to the production of short coherent texts.

The Vygotskian theory of the zone of proximal development has provided a reference point for the construction of a conceptual framework to guide the study. The zone of proximal development (Vygotsky, 1978) refers to

... a range of cognitive ability levels that an individual could achieve under differing conditions of environmental support starting from the "child's independent, or functional, level of problem-solving performance (Vygotsky 1978) and a higher scaffolded level (Wood 1980) which is possible under the direct guidance of an adult or more capable peer. (Gallagher & Wansart, 1991, p 37)

The view that with assistance a student may progress further than he/she would in isolation is relevant to the questions posed in this project. The approach of prompting, responding, questioning and interacting (scaffolding) was considered to be appropriate in the research context of this
study. The students who participated in this study demonstrated again and again that they could achieve more with help than they would have done alone. They also demonstrated that the experience of achieving with help led to engagement with the process demonstrated and to eventually developing the process as part of their own repertoire of behaviours to support their learning. Thus paralleling the observed process of proleptic instruction described by Reid and Stone in relation to Vygotsky’s theory of development. The social interactions which occurred in the class setting during this study certainly provided support for the participants and contributed to the extension of literacy learning. Evidence that social interactions in other contexts was also a strong influence is apparent in the instances of intertextuality and the use of events and knowledge from other contexts as sources of text.

**Literacy**

**Meaning in Context**

For the notion of literacy to become meaningful it has to be situated within a theory of cultural production and viewed as an integral part of the way in which people produce, transform and reproduce meaning. Literacy must be seen as a medium that constitutes and affirms the historical and existential moments of lived experience that produce a subordinate or a lived culture. (Freire, & Macedo, 1987, p 14)

Margaret Meek in her foreword to the above work, notes

As we have learned more about the development of children’s language and thought as interactive processes in the sharing of talk and meanings so we have come to realise the force of Freire’s primary tenets. They chime in with and complement those of Vygotsky. For both, learning involves both culturally transmitted understanding joined to the use of tools (including reading and writing) devised to enlarge one’s grasp of the world for the purposes which the user intends. Reading and writing are socially learned; they are sets of social practices.
For literacy to be relevant it needs to be based in the learners own known world. The informants in this study expressed their meanings in terms of their own experience. They were encouraged to write about things known, so much of the writing was personal information, they were writing about their lives.

**Literacy Development**

The literature reveals a holistic view of language learning is currently prominent. The separation of language learning into separate areas is being replaced by an approach which stresses the interdependence of all aspects of language, receptive and expressive. Experience gained in one literacy encounter is a gain which can be used in future literacy events, knowledge from other contexts can be transferred to new contexts. Language learners are regarded as active, constructive participants who build their own world of meaning from social and cultural encounters. Demonstrations from more experienced language users is a major factor in providing models of functions and forms of language use.

The participants in this study proved themselves to be active learners as they took control of their writing, developing their repertoire of strategies to support their construction of text. The sociocultural influence was apparent as they interacted with more experienced language users in the classroom setting. They exploited the environment, using any support that their knowledge of ways of scrounging literacy models from other sources could provide. They showed in their progress that they were formulating their
own hypotheses and modifying them as they moved towards more conventional spelling and grammatical structures.

**Special Education**

In the field of special education it is apparent from the literature that there is some dissatisfaction with the hitherto dominant behavioural influence. Educators are looking for a more open approach and a more student oriented practice which takes account of the social context considered so central to learning by Vygotsky, Bruner and by proponents of the current language/literacy theories associated with a holistic and constructivist approach to education. (Goodman, Graves, Harste, Woodward & Burke, Cambourne, Holdaway, Smith and others). In practice, acceptance of change is much slower than in theory and research. This study may provide some information which will serve to clarify some of the issues pertinent to the education of intellectually disabled students.

Students with special educational needs are still being assessed and their developmental level determined according to conventional testing procedures. As previously discussed, instruction is generally aimed at the assessed level, at the "ripe not the ripening functions". However, the students in this study demonstrated that they too could "push beyond their developmental level" with support and encouragement and an environment conducive to active learning.
Computers and Learning

Not many studies have been carried out with computers in the classroom which relate directly to the concerns addressed here, however, research into the use of computers for word processing points to the interest holding factor which was apparent in the course of this study. The use of the word 'motivation' occurs with great regularity in many reports of research on the use of computers in the classroom. In relation to the use of word processing with intellectually disabled students, the reports are generally positive. (Macarthur & Malouf, (1991), Morocco, (1987), Daiute, (1985), Lindsay & Marini, (1987). Certainly it was evident in the way the students in this study maintained an interest in using the computer for writing.

Exploration of the keyboard has been noted as a learning experience in a number of studies, the students involved in this study demonstrated their independent learning as they observed, modelled, and questioned computer functions for the purposes of their writing. The editing behaviour noted confirmed Crozier's (1986) observations about first revisions. Most of the revisions carried out by the students were of a simple nature, however, in the later stages some more complex changes were observed. Most of the early editing was not for meaning or structure but was deletion of incorrect letters and insertions. Evidence of editing for meaning and structure was observed in the later stages of some of the case studies. The use of the computer enabled changes to be made without the effort of rewriting.

The use of the computer for literacy learning meshed in with the language environment of the classroom in a way which served to emphasise the process of interaction across language encounters as explicated in the linguistic data pool of Harste, Woodward & Burke.
Concluding Remarks

What was relevant to the study of literacy learning was the way the students acquired the skills, knowledge and understanding of the process of writing and how the strategies they used evolved. The literature drew attention to the importance of cultural/social and environmental factors which might impact on the learning process. The focus of the observational strategies thus stemmed directly from the synthesis of the theories of learning discussed.

The classroom observations carried out during this study were assisted by the concepts drawn from this literature. The links with Vygotsky's work on language/thought and generalisation became evident in the events described in the case histories. It fitted well with the processes observed to operate in a language environment based on a holistic philosophy and in the conjunction of the use of the computer for literacy learning.
METHODOLOGY AND METHODS

No researcher commences the process with a tabula rasa or content and value-free mind. Initial questions reflect judgements about what is worthwhile investigating. (Saran, R. 1985, p211)

This investigation is theoretically grounded in a social theory of language and learning. The focus of this study is not the computer per se rather it is the use of computers as a writing tool within the language learning context.

Introduction

This study of the use of the computer for literacy learning with intellectually disabled students involved direct observation of emergent literacy behaviours in a junior integration class in one special purpose school. Methods of the naturalistic paradigm were chosen because they were in accord with the aims of the study and suited the classroom setting. Participant observation provided a non-threatening mode of investigation with which the subjects were comfortable whilst the theoretical concepts provided the framework within which the research focus was located.
The data was obtained by participant observation, recorded field notes, student products (hard copy of computer work and some writing and drawing), interviews, and discussion with teachers, parents, principal and students.

This involved:

- direct observation of student behaviours when using the computer for writing (literacy learning);

- recording of detailed observations in field notes and analysis of the students 'products' in conjunction with the field notes to provide the core data;

- records of interviews were used to support the core data and provide some triangulation.

**Rationale for the Choice of Paradigm**

The choice of research paradigm is dependent on the 'fit' of the methods to the phenomena being studied. The five axioms of Naturalistic Inquiry were applicable to the study as shown in Table 2.
TABLE 2.

**Naturalistic Inquiry**

<table>
<thead>
<tr>
<th>Axioms</th>
<th>Implication for this study</th>
</tr>
</thead>
<tbody>
<tr>
<td>The assumption of multiple realities, dealing with constructions that exist solely in the minds of people</td>
<td>The students compositions were based on their own 'realities', stemming from life experience and prior knowledge. The researchers interpretation of the behaviours witnessed were also realities stemming from life experience and prior knowledge</td>
</tr>
<tr>
<td>The assumption of investigator-respondent interaction, these inevitably influence one another</td>
<td>Student-investigator interaction was a pivotal part of the study</td>
</tr>
<tr>
<td>The assumption of non-generalizability, human behaviour is time and context bound</td>
<td>The study encompassed this particular group of students over a particular time span and thus is not necessarily generalisable to other times and contexts</td>
</tr>
<tr>
<td>The assumption of multiple shaping-an action may be understood in terms of multiple interacting forces that shape it and are in turn shaped by it</td>
<td>The students were influenced by past experience, by the researcher, by their teachers, parents and peers and in turn influenced those contacts. No direct cause-effect relationships were sought</td>
</tr>
<tr>
<td>The assumption of value boundedness-all of us exist in a value context, think in terms of concepts that are in part value determined, use methodologies that are rooted in values and do our research in situations that are also value rooted</td>
<td>The researcher held certain beliefs which influenced the conduct of the study. To guard against observer bias measures were taken to ensure credibility and reliability of the data - see below, and Processes of Data Analysis</td>
</tr>
</tbody>
</table>

After Guba & Lincoln (1982, p.17)
The interactive relationship of researcher and subject is acknowledged in naturalistic research. The "human instrument" is the predominant instrument of data collection and analysis. The subject cannot be isolated and viewed in a vacuum but as long as checks are made to identify observer bias there can be valid outcomes from the data. The rationalist paradigm pre-supposes that there can be separation of observed and observer as though the researcher were invisible but as Heisenberg (1958) cited in Guba & Lincoln (1985 p 98) put it "What we observe is not nature itself, but nature exposed to our method of questioning."

Heisenbergs' uncertainty principle:

... demonstrates that the act of measuring or observing affects the action of whatever is being observed or measured. It thus challenges the possibility of a completely detached observer. (Goetz and Le Compte, 1986, p57)

Goetz & Le Compte (1984, p. 48) suggest that

The primary criteria for selection, development and implementation of a research model is whether a design allows the researcher to address effectively the research goals and questions posed.

The methods used allowed investigation of the focus of the study and of the emerging questions as the study evolved.

This investigation relied on the evidence of observed phenomena to build up theories grounded in the data. The processes of literacy learning observed as the children attempted to make meaning using the computer for writing, and the strategies they developed to aid their writing provided
the focus of the study. The data was the source from which the categories emerged during the investigative process and was the driving force which dictated the direction of the inquiry. Guba and Lincoln clearly show the evolutionary nature of naturalistic research when they say

Theory emerges from the inquiry for the naturalist; it is not given a priori. If the methodology must be resonant with the theory, methods can be clarified only as theory emerges, and the methods may very well change in the process of theory definition. (Guba & Lincoln, 1985, p 224).

The naturalistic investigator observes events in a natural setting, gathering data upon which theory may be constructed in an open-ended manner. This allows the investigation to be flexible and responsive to changes in data flow. The questions emerge and evolve during data collection. The investigation is structured by events and does not adhere to a previously determined design and pre-conceived theoretical constructs. This is grounded theory: theory which is based on phenomena observed during the course of an investigation. "...theory that follows from data rather than preceding them" (Guba and Lincoln, 1985 p 204).

... you are not putting together a puzzle whose picture you already know, you are constructing a picture which takes shape as you collect and examine the parts. (Bogdan & Bicklen, 1982, p 29)

The real question in the choice of methodology is whether the methods used are the best in the particular context. The chosen method of 'prolonged engagement' and 'persistent observation' of events in the class setting provided an in depth study focussed on the use of the computer in the classroom which could not have been achieved using other methods.
Furthermore, naturalistic investigation maximizes the range of data both qualitative and quantitative which can contribute to the explication of the data.

Finally it should be noted that naturalistic research as a vehicle of inquiry has particular relevance in the field of education, in-classroom investigation is becoming established as a source of information for policy makers.

Flow of Research Pattern

Guba & Lincoln (1985) outline the flow of a naturalistic research program in the following way:

...naturalistic studies are virtually impossible to design in any definitive way before the study is actually undertaken. But naturalistic studies do have a characteristic pattern of flow or development ... Naturalistic enquiry is always carried out logically enough in a natural setting, since context is so heavily implicated in meaning. Such a contextual demands a human instrument, one fully adaptive to the indeterminate situation that will be encountered. The human instrument builds upon his or her tacit knowledge as much as if not more than upon propositional knowledge, and uses methods that are appropriate to humanly implemented inquiry: interviews, observations, document analysis, unobtrusive clues, and the like. Once in the field, the inquiry takes the form of successive iterations of four elements: purposive sampling, inductive analysis of the data obtained from the sample, development of grounded theory based on the inductive analysis, and projection of next steps in a constantly emergent design. The iterations are repeated as often as necessary until redundancy is achieved, the theory is stabilized, and the emergent design fulfilled to the extent possible in view of time and resource constraints. Throughout the inquiry, but especially near the end, the data and interpretations are continually checked with respondents who have acted as sources, as well as with counterpart individuals; differences of opinion are negotiated until the outcomes are agreed upon or minority opinions are well understood and reflected. (Guba & Lincoln, 1985 pp187,188)

Fig. 1.outlines the flow described above.
Fig. 1. The Flow of Naturalistic Research (after Guba & Lincoln)
This particular study followed this outline. The study was carried out in a natural setting with human as instrument. Interviews, observations, analysis of the data, and from this, development of grounded theory in an iterative process which shaped the evolving design. Checking was through interviews with stakeholders, canvassing their opinions and judgements. The participants themselves had difficulty responding to analytical questioning, (their products had to speak for them). Peer de-briefing and group consultation with fellow post-graduate students was a valuable source of stimulation and method of reviewing the process. These discussions often provided pointers for re-thinking throughout the course of research development.

**Setting up the Research Context**

**Negotiating with Authorities**

Prior to embarking on this study, discussions had been held with the Principal and class teacher outlining the purposes of the study and the proposed use of the computer in the class setting. In consultation with the Principal it had been decided that the members of the Junior Integration Class (the class which would be involved in an integration program with a general primary school) would be the subject class. The class teacher was in agreement. Permission was sought from all parents for their children to take
part in the study. I composed a letter requesting this permission and briefly outlining the operation, this was sent out by the class teacher (a copy is included in Appendix 2). A similar letter was sent out each year as the class members changed.

The proposal for data collection as outlined was approved by the Ethics Committee of Wollongong University. Brief meetings were held to introduce myself to the parents and to inform parents of how the computer would be used with their children. Permission to use first names was given. As new students came in, I met with their parents at class functions and so kept in touch and made sure all parents were aware of the study.

Negotiating the Class Context

The first phase of this investigation of the use of computers with mildly/moderately intellectually disabled students was one of exploratory investigation, and familiarisation with the setting and the variables which might impact on the proposed study. The first consideration was the most appropriate place and time for the study to be carried out. It was decided that this would be during the time the class spent as an integration unit in a nearby primary school. For two days a week they attended the primary school in the infants/kindergarten section, there they had their own classroom and worked independently, following their own curriculum with the class teacher and an aid. They did, however integrate with the infants classes for dance, social activities (during breaks) and for language classes.
The computer was established in the class setting as an integral part of normal class activities. This had the added advantage that the students would have access to computer facilities similar to those available to other students in the school. They would be seen to be using the computer just as the other classes did.

During the first few visits, which commenced in July 1985, participation in the general activities of the class helped to establish acceptance of the researcher in the classroom.

**Negotiating with Subjects (Getting to know you?)**

The fact that I was accepted readily is indicated by these extracts from my field notes. The first day that I met them they said "good morning" as instructed by the teacher, and looked me over curiously as he explained that I was going to spend time in the class and that I would bring a computer for them to use for writing. Then Natalie came over and shook my hand and told me her name. Several others followed which broke the ice then they settled down to normal class activities and I moved amongst them, listening to their stories, looking at work, giving assistance. An easy rapport was soon established with the children and they communicated readily with me. Those with speech defects made special efforts to make sure I understood them and I made special efforts to ensure that I did.

After a few weeks of general observation, the computer was brought along, there was great interest and all crowded round to see. Over a period from July to the end of October 1985, visits were maintained at intervals of once
or twice a week and all the students used the computer. Initially, some operating procedures were demonstrated but essentially they were exploring the computer for themselves.

Before we started using the computer I had written the names of the children on a sheet of paper to make notes on their activities. All of the students could pick out their names, even if only by the first letter. This indicated that all of the children recognised that 'writing' has meaning.

During the first introduction of the computer, all of the children typed their names, or attempted to but needed assistance. This took some time as there were all those keys to explore and finding the right ones was a task! Some would repeat letters just by pressing continuously but this was soon corrected using the delete key. Without exception, the children quickly learned to use the delete key! As time passed acceptance of my presence and the inclusion of computer time as part of the normal class activities was obvious. My field notes are filled with descriptions of behaviours which demonstrate this.

**Timing observation periods for maximal advantage**

In the initial phase the computer was used in the class setting in conjunction with the language education time, the session would last for approximately two hours. I set up the computer whilst the class was engaged with the primary infants class in a joint language /writing class in the adjoining class room. The students completed their "story" (drawing in language work book) and showed it to the teacher, primary teacher or myself.
and told the 'story' and the text was written if it was finalised. The computer was in the adjoining room (an open access situation whilst the joint class was in operation). As the students finished their stories or other activities and were ready to use the computer, they moved back to the class area and the computer sessions began. Other students continued with language activities. By the time the joint language session concluded, the whole class would have returned to their places and would continue with their normal language related activities in class. Word recognition - story time-elling news- writing (letter/number/names)-group drama, shared books. Each student in turn would be selected to be "next" on the computer and this student would leave the group activities to work on the computer. He/she would still be in the class context and in touch with what the others were doing so that the class setting was not disturbed by the investigation. Generally a one to one relationship of student with researcher was maintained, occasionally other students would approach and give advice/ask questions or insert typing. Detailed recording of the way the students progressed in literacy learning as they interacted with the computer, using Bank St. Writer and an Apple IIC computer was the basis of the investigation. No specific tasks were set. The students explored the computer and their behaviours were observed. In particular, interactions that occurred as they composed text, using the computer for writing were noted. In this way the linkage between the language environment of the class situation and the use of the computer was made explicit.

In the second phase the routine had become established and the 'computer days' were an expected part of the school week. In February of 1986, the visits to the primary school recommenced and continued at the rate of twice a
week, generally for a period of two hours each time. Contingencies did arise such as special days/lessons/visits when there would be some disruption. There were other interruptions to the schedule such as camps, (school holidays of course) or other planned activities.

By July of 1986 some of the students were participating in various classes in the general primary school. They would attend some of the general classes, integrating more and more with other activities in the host school and thus the whole 'class setting' was disintegrating. The original class teacher had left by this stage and after a few weeks with a temporary replacement another teacher had taken charge of the class. After discussions with this new teacher it was decided to move the observation sessions back to the Special Purpose school where the class setting would be intact. In the circumstances at that time, this was a more satisfactory arrangement as the class setting was maintained. The sessions continued but because of time tabling restrictions (two days were still spent in the general primary school) they were reduced for the most part to one day per week. It will be noted that student records are not always continuous, this was due in some cases to time restrictions, I always tried to work with each student at each visit but sometimes this was not possible. Other reasons were that students had commitments to specialists, special instruction groups, to camping, organised outings and there were absences due to illness.

At the beginning of 1987 a new teacher took over the class but stayed the full year. In 1988 another change of teacher occurred but again for a full year and yet again in 1989 for another full year.
Data collection continued until November, 1989. Most of the group of continuing students were to go into primary schools at the beginning of 1990 and so this drew the investigation to a natural conclusion.

**Methods of Data Collection**

The preliminary investigations during 1985 were intended as a pilot study, the first phase was to be observational to guide the development of the data collection procedures and mode of operation in the setting. However, after only two to three weeks it became apparent that usable data was emerging from the first exploratory use of the computer. Prior to the introduction of the computer, recording of events was in reflective journal notes which were written after the sessions. During the sessions I concentrated on observing the whole class and their behaviours in the language/literacy context. I then tried to make decisions on relevant procedures for data collection and to identify observable phenomena and to review "What was going on" in terms of literacy behaviours from the records of events.

When the students started to work on the computer records of behaviours were made, but initially these were confined to actual activities (dictated, copied, independent) and modes of operation i.e. (free/exploratory, directed, assisted). It soon became clear that it was essential to note as far as possible all actions and communications which contributed to literacy learning when using the computer. These could be away from the computer - looking for books, cards, posters, words on posters and interactions with others.
In the early stages I tried to actually record the behaviours in categories whilst working at the computer. It was too difficult to do this effectively whilst trying to keep track of communications, interact with the students and observe all events. I had to rethink the recording strategy. The solution was to record all behaviours/events/communications in as much detail as possible using descriptive field notes and to use the hard copy of products on which I also made notes at times, plus memory to elaborate and support the notes taken. The recorded data could then be categorised at a later stage.

In summary the data collection procedures employed in this study were:

i. Descriptive field notes of student behaviours whilst working on the computer;
ii. Student's products, i.e hard copies of all writing activities using the computer and some hand written work;
iii. Student records were compiled using observers field notes and correlating these with each student's output;
iv. Unstructured /semi-structured interviews with a number of different stakeholders.

Further details of each of these procedures are described below.

**Descriptive Field Notes**

Observations in the form of written field notes were a major source of data. These notes were taken by hand and re-written more fully later. The aim was to be descriptive and not evaluative or judgemental. The main focus of observation was each individual subject and his/her behaviours as they used the computer. In order to provide a focus for observation the following protocols for the collection of data were drawn up:
a) Observe everything the student does
b) Record all behaviours
c) Take particular note of writing/reading activities
d) Take particular note of interaction with computer
e) Note interaction with observer/others

An example of field notes/student product/student record is given immediately below.

Field note:

23-7-87

MARK
Types name to retrieve file and operates return himself- goes to bottom of file. Reads some of the text as he goes down (correctly) reading his work back very well and this is at a distance in time from when the work was done - there are only a few problems with isolated words.

He copied date from top of my notes - corrects where errors and puts in dashes as I had done.

Typed Melanies Birthday (copied from wall chart) - misses a space and goes back to correct. Types FIR & corrects to FRIDAY and adds stop.

I asked "Is Melanie going to have a party?" he typed 'YES SHE HEAF A PEATE.' I asked "Have you a present for her?" he typed 'A PEASSAEAN' He then tried symbols - holding down the shift key deliberately to get them. Inserts space when missed. Typed 'ADAM DAED CAEEAAS THE FHRSH' (Adam did catch the fish) He told me he had a day fishing with Adam when I asked if
he had been fishing. Is responding in print to my questions, he typed 'YAD AND DAY ADAM' (Yes a day with Adam).

I said "The sun is coming out" - he typed 'Yes'

Q. What do you do in the sun? he typed 'I SEAEEP IN THE SENNY (checked on board & corrected to SUNNY) DAY'

I said "Do you go for a swim?" he typed 'NO'

Q. Are you going on an excursion soon? he typed 'AT FEAEE' (Figtree)

Q. "What will you do there?" he looked around and typed 'HAET SEMM FEAT' I asked 'What kind of food? He said and typed AEPPL (apple) AND OEATURG (orange) BAERTUES (bananas). 

(These notes continued for each session.)

**Student products**

All student work was saved as individual files on the computer and later printed off for examination and use in compiling student records. Copies were given to the students and the teacher at intervals. Printouts were updated as work progressed and final products at the end of the data collection were later categorised and analysed.

Some of the students from time to time would use a pen or pencil to write or illustrate their meanings. Where possible these were retained for later
reference to give insights into behaviours but this was only a minor component of the data.

It was evident from such examples that greater manual effort was required in the use of pen and pencil and in neatness and presentation there was no comparison with computer products. This could be one reason why the students enjoyed using the computer so much.

Hard Copy

23-7-87

MELIANIE'S BIRTHDAY ON FRIDAY.

YES SHE HEAF A PEATE.

A PEASSAEAN.

_+?><!@#$%^&*

ADAM DAED CAEEAAS THE FHRSH (ADAM DID CATCH THE FISH)

YAD AND MARK DAY ADAM

YES I SEAEEP IN THE SUNNY DAY NO AT FEAEE H AET SEMME FEAT
*NB. Where I had typed the wording afterwards, he had told me what he had typed and a conversation about his text had prompted further typing - see below.)

**Student Records**

Student records were developed by rewriting and reworking the rough field notes. Records for each student were set up and maintained on the computer.

The process was:

- Detailed notes were made of the students' behaviours when using the computer, these were the basis of the students' records.

- The hard copy of the students work was used to assist in expanding the details of events during the period of observation, this also provided triangulation. This was done as soon as possible after each session.

- The hand-written notes were referred to later to check accuracy and clarify meaning particularly if there appeared to be discrepancies when the data was examined during analysis.

- As far as possible, all activities were noted, copying from books or charts or the blackboard, their comments as they typed or conversation leading up to a literacy event.
An Example of a Student record

23.7.87

Mark retrieved his file by typing his name and moved to the end of the file. He read out some of the text as he went, he had some difficulty with a few words but he was reading back from his work very well, particularly as some of it was from some time ago. He copied the date from my notes, putting in dashes as I had done. He then typed MELANIES BIRTHDAY ON FRIDAY (copied birthday from wall chart, but the rest was independent). He typed FIR and corrected to FRI in FRIDAY, inserted a space and ended with a stop. I asked "Is Melanie going to have a party?" He did not reply verbally but typed 'YES SHE HEAF A PEATE' (Yes she have a party) the written (typed) dialogue continued when I asked "Have you got a present for her?" He typed 'A PEASSAEAN" (a present), he used return to go to a new line and put a stop after each of these responses.

He again ran through the symbols, holding down the shift key deliberately.

He then typed 'ADAM DAED CAEEAAS THE FHRSH' told me "Adam did catch the fish" and responded with 'YAD AND MARK DAY ADAM' when I asked if he went fishing with Adam? - Yes he had a day fishing , and Mark had a day with Adam".

He continued to respond in print to my comments, I said "The sun is coming out" , he typed 'YES' , I asked "What do you do in the sun?" he typed 'I SEAEEP IN THE SENNY DAY' (checked on the board and corrected to SUNNY - I sleep in the sunny day). I asked "Do you go for a swim?" He typed 'NO'. I then asked him "Are you going on an excursion soon?" He
typed 'AT FEAEE' (Figtree). My next question was "What will you do there?" He looked around the room for help but then typed unaided 'H AET SEMME FEAT ' (told me "have/eat some food"). I asked "What kind of food?" he typed 'AEPPLAND OEAUTURG BAERTUES' , told me "Apple and orange and bananas".

**Interviews**

Semi-structured interviews were employed in the case of class teachers and Principal. A more informal approach (unstructured) was used with parents and informal chats were held with students.

The Interview Protocol used was intended to probe for information on particular aspects of background, beliefs, attitudes and opinions with respect to the area of the study. In the case of the Principal particular reference was made to effects and attitudes within the school.

The class teachers were interviewed, (those with long term association with the class) at the end of the school year. Regular informal talks were held with all teachers, including those with short term association.

Both Principals were interviewed. The first Principal formally, in October 1987 but there had also been a number of informal discussions concerning the progress of the study and his perception of the value of the project to the class.
The second Principal was interviewed September, 1989, and again informally in 1991, there had also been numerous chats and informal consultations as with the previous Principal.

One parent was interviewed in her home, 15.12.87, at her request, her son was returning to a primary school and she no longer visited the subject school. This was the only formally recorded parent interview. I later held a lengthy discussion with this parent on the telephone (December, 1991) during which she gave me current information on her sons progress, this is included in interview records. One other parent was also interviewed on the telephone.

With other parents informal chats were held during informal meetings in the school. These were mainly aimed at gathering information concerning their attitudes to the study and their opinions if the use of the computer was "helping young ........ with language learning/writing/reading". All gave very positive feedback.

The record of interview was returned to the person concerned for checking. These were all accepted as reflecting the substance of the interview. The mother interviewed at home sent a letter of thanks indicating that she felt inclusion in the study had greatly helped her son.

An interview protocol was prepared for use with the students but in practice it was not possible to follow it through and so I simply asked a few questions - If they liked to use the computer - How they thought of what to write - What they write on the computer how is it different to writing with pencil?
- Do Mummy/Daddy/sister/brother help with writing at home? A summary of student responses obtained is shown in Appendix 2.

Interview protocols and records of interview are to be found in Appendix 2

Fig. 2. Summarises Data Collection Sequence
Fig. 2. Data Collection Procedures

Observation of student interactions with Computer/Environment/Peers Teacher/Observer

Recording of behaviours in field notes

Printing and collation of hard copy products and collection of other products

Referring back to original data

Correlation of products with Field notes

Production of student records

Interviews - semi-structured and informal

Record of interview returned to informant for checking

Member checks

De-briefing

Leading to

Ordering of data and selection of procedures for analysis
Methods of Data Analysis

In this study, the core data consisted of the field notes made by the researcher, the products of the students and the student records compiled from these. All other data was supportive and used to check the findings emanating from examination of the core data. Data analysis was continuous throughout the study, evolving over time to provide the means in the final stages to examine the observed phenomena in a way which focussed on the central concerns which drove the enquiry. In the initial stages the core data provided insights into the behaviours and emerging strategies the students exhibited in their literacy learning. This generated working hypotheses which led to the refining of the collection procedures and elaboration of recording strategies.

Goetz & LeCompte (1984) identified:

...four components critical to concluding a study: presentation of analyzed raw data in a form accessible to readers; interpretation of the raw data; integration of those interpretations or meanings into a more general conceptual or theoretical framework; and a statement of the significance and applications of the study's results. (p 61)

These four identified components have provided a broad guideline for the analytical and concluding section of this study.

Developing an Audit File Code

Fleet and Cambourne (1989) conceptualised a code "as a method of classification which has two fundamental characteristics:
i. A set of two or more categories for dealing with phenomena in a way which is meaningful to the problems which have to be solved;

ii. A set of mapping rules for assigning the phenomena to these categories.

To be effective, coding should have discrete categories and reliable assigning of elements of the observed phenomena to those categories.

Whilst detailed description of both the subjects behaviours and the context is needed to give a comprehensive picture 'thick description', it is necessary for the data to be coded into categories to facilitate analysis. In coding qualitative data the researchers' tacit knowledge and ability to gain insights from observation is as important to the formulation of theory as is the mass of data. A set of criteria regarding inclusion or exclusion of information is needed, Guba and Lincoln, (1981, p99) proposed a set of such criteria which provide useful guidelines. Once a preliminary set of categories which encompass the issues and concerns germane to the study has been determined these can be built on, and evaluated. New categories may stem from examination of the information collated in the first set. This process operated during the establishment of the categories used for this study.

The first task was to order the data by the delineation of categories relevant to the focus of the study. When an issue or concern was established and information pertaining to it accumulated this provided the base for the category.
Coding of the Core data

The first attempt to establish a system of categories was very early in the investigation, this aimed at defining the mode of operation the students were using.

A. Mode of operation:

i. Free/exploratory - completely unguided, student exploring the computer independently.

ii. Directed - I would offer instructions of how to operate and point to keys to indicate which to press (this might be where the student dictated the story but could not independently write any sentence).

iii. Assisted - here the student would be attempting to write in their own fashion but would ask for help with unknown letters.

B. Mode of typed input:

i. Dictated - student would dictate a story. I would type or assist student to type.

ii. Copied - copied from story book, environmental print or my handwritten version of their story.

iii. Independent - student typed independently.

This system was tried at the keyboard and did not prove operable as explained previously. However in the final analysis some categories emerged which aligned with these initial attempts.
At a later stage, a preliminary set of categories which covered the major concerns was established. The first set of categories was later refined and expanded as shown in Appendix 1. The categories were entered into a database and information from the recorded data was fed in to facilitate initial steps in the analysis.

The program used was Microsoft File. The data base could be used to isolate different student records and to provide a facility for comparisons across categories over periods of time. The format is extremely flexible and can be re-arranged to allow examination of all or of specified fields. All records were dated and numbered, as different students were at different stages during the course of the study. The recorded entries could be referenced with the on-file student records and hard copy products which were also dated. Each numbered student record on the data base could be compared with other students at the same stage.

The evolution of the data analysis methods used is detailed below.

**Processes of Data Analysis**

The main goal in developing the analytical procedures employed in this study was to produce a method of examining the data in such a way that the final analysis would be a clear explanation of what the 'data tells'; a description and interpretation of what happened in the literacy learning situation observed.
Categories

In determining categories I was searching for a means of focussing on the critical elements of the learning behaviours exhibited by the students as they attempted to unravel the mysteries of language/literacy. I therefore devised a criterion guide:

* Look for focus in categories - look for patterns- ask the question: Do they explain what the thesis wants to know?

The categories in the first instance were informed by the students observed behaviours and my own tacit knowledge. For example it was apparent that students drew on information available to them in the environment. They looked at charts around the room, checked the board for words and looked for words in books. (Using the environment became one of the categories in the final breakdown of the data.)

In the early stages a number of broad categories were considered within which more specific sub-categories could be defined. Because the major focus of the study was 'how do the students develop literacy skills and is the use of computers in the class setting a positive influence on their literacy learning?' I looked for evidence of activities and functions which supported their learning.

1) Were there changes in behaviours which could be classed as literacy learning?

2) What strategies were used in composing a text?

3) Did use of the computer encourage writing activities?
Major factors which emerged over time were: their use of environmental print, support gained through social interaction and their development of interest and motivation in using the computer. The information collated from these observations gave insights into how the students coped with learning reading and writing; their development of strategies to aid learning over time and the role of the computer in the development of their literacy learning. I looked for breakthroughs where a clear indication of change in operations occurred and where it was apparent that the student had made a discovery. I intended to try to identify a time-line by tracing breakthroughs and discoveries.

The literature review was helpful in the formative stages of determining possible areas of categorisation. The following broad areas were the base line from which the eventual analytic code was developed. Initially five broad areas were considered:

**Category set 1.**

1. **Computer functions**

   This category was chosen because the use of the computer was a major concern of the study so I needed to examine the way the students reacted to and operated the computer.

2. **Cognitive abilities**

   This category was intended to provide some understanding of the students level of ability.
3. Control of language

This category aimed to explore the students knowledge of language in relation to literacy.

4. Coping strategies

This category was selected to elucidate the ways in which the students found support to enable them to express meaning and to demonstrate literacy gains.

5. Scaffolding

This category was considered to be an important element in assisting children to progress further than they would have done if they had no external assistance. (Although this did not remain as an identified category it is inherent in social interaction.)

This system was considered. On closer examination I decided that these five groupings needed some clarification and refinement to be definitive of the actual behaviours observed.

These were then reduced to four areas which were:

Category set 2.

1. Computing Skills

As the use of computing functions was embedded in the developing skills the focus needed to be on the operating skills. Students changed their interaction with the computer from exploratory/investigatory to a deliberate use of functions.
2. Language - Cognition and Control

Two categories were collapsed here as the cognitive functions under scrutiny were in the language area and could be viewed in conjunction with language skills.

3. Coping strategies

The range of coping strategies observed were more clearly defined at a later stage.

4. Social interaction as a language learning strategy

As I kept examining the data it seemed that looking at social interaction as a whole was a more comprehensive way of organising the data. It opened up the field of observation to the various facets of support which incorporated scaffolding.

These four broad areas were then re-examined and sub-categories considered these are listed below.

(See Appendix 1 for details)

1. Computing Skills:

a) Discovery of functions- exploration of keyboard
b) Operating functions (switch on, insert disk, retrieve file, disconnect)
c) Use of keyboard and keyboard functions (delete, space, return, shift, arrow keys)
d) Use of program functions (ESC - transfer of menu, change of mode, type, print, retrieve, clear)
e) Making connection between action at keyboard and result on screen
f) Communicating through the computer, for example direct typing on the computer in response to questions

g) Editing, for example correction of letters, spelling or formats.

These sub-categories emerged from the researchers past experience and tacit knowledge, from observation of the students interaction with the computer and from reading of the literature dealing with computers used as a tool in learning situations. The focus was aimed at answering the research question of 'What is the role of the computer in literacy learning with learning disabled students?' The constant narrowing of the data following examination of records allowed these elements to emerge as important factors in the computer related side of the equation.

2. Language -Cognition and Control:

   a) Decontextualisation of meaning as in the transfer of information across different contexts. Intertextuality (life to text, text to life or text to text) as a meaning making strategy. This occurs when knowledge from one context is transferred to another as in links with other texts and links with experience in life or links with other communication media.

   b) Use of picture association to find meaning

   c) Knowledge of symbols as representations of meaning

   d) Recognition that different symbols can have common meaning for example '3 and three'

   e) Knowledge that 'writing' can be 'read' back and holds its meaning. When meaning is accessed from written text then the reader can construct the original message

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f) Use of conventions: recognising the discreteness of words, and functions of spacing, punctuation, capitals, format; the use of syntax and grammatical structures

g) Representational thinking - thinking of a subject and picturing it (Abstract thinking)

h) Expressing meaning through symbol systems

i) Editing

These sub-categories also emerged from re-examination of behaviours, from observation, tacit knowledge, information from the literature and a focussing on the research questions.

3. Coping Strategies
(Refer Cambourne & Turbill, 1987)

a) Transfer across media or modes. Starting with the socially constructed original linguistic data pool, connections can be made with new experience and new modes of expression. Each literacy encounter provides experience which can be used in other encounters

b) Drawing can be used to express meaning

c) Placeholding, random or selective use of letters to represent meaning

d) Use of repetition to retain a theme through retention of topics or repetition of words to improve approximations in progressing to conventional spelling

e) Sight words, the recognition of words from memory evidenced by spelling from memory
f) Copying from text or screen

g) Use of environmental print

h) Use of temporary spelling

i) Spelling by sound/symbol equivalence

j) Phonemic segmentation, the use of exaggerated pronunciation to emphasise sound units

k) Structured thinking, organising "I am going to write about", deciding on a course of action and using strategies to follow through

These coping strategies had been identified in previous studies in language learning situations in regular classrooms. (Cambourne & Turbill, 1987) Their observations served to reinforce the proposition that literacy learning is supported by many external factors and can be enhanced by giving assistance but allowing independent learning. For many learning disabled students this is not always the case. 'Concrete look and do' or 'copy' methods can be a detriment, dampening any inclination towards abstract thought needed for writing. Encouragement of independent thought was inherent in the approach taken in this study.

Vygotsky foreshadowed this in his writings when he observed

Formerly, it was believed that by using tests, we determine the mental development level with which education should reckon and whose limits it should not exceed. This procedure oriented learning towards yesterday's development, toward developmental stages already completed. The error of this view was discovered earlier in practice than in theory. It is demonstrated most clearly in the teaching of mentally retarded children. Studies have established that mentally retarded children are not very capable of abstract thinking. From this the pedagogy of the special school drew the seemingly correct conclusion that all teaching of such children should be based on the use of concrete, look-and-do methods. And yet a considerable amount of experience with this method resulted in profound disillusionment. It turned out that a teaching system based solely on concreteness- one that eliminated from teaching everything associated with abstract thinking-not only failed to help retarded children overcome their innate handicaps but also reinforced their handicaps by accustoming children exclusively to concrete thinking and thus suppressing the rudiments of any abstract thought. (Vygotsky, 1978, p 89)
The concept of the 'zone of proximal development' put forward in this book is very relevant to this study. Vygotsky proposes that the level of achievement a child can attain with assistance is the outer level of development and that "what a child can do with assistance today she will be able to do by herself tomorrow"... "a person can imitate only that which is within her developmental level" this belies the concept that independent activity indicates level of mental development.

4. Social interaction as a language learning strategy

Scaffolding

Use of social interaction as base for learning-modeling

a) Intertextuality as a meaning making strategy. Starting with the socially constructed original linguistic data pool, connections can be made through links with other texts, life experience and other communication systems

b) Assistance requested or offered which enabled the student to progress further with writing than he/she would have completed alone. Vygotsky's Zone of proximal development socially driven

c) Verbal or visual prompt used to help student to gain control of knowledge internalised but not accessible without assistance

d) Use of environment to provide information to assist in building word or sentence

e) Asking for assistance, from researcher/peers/teacher

f) Use of internalised knowledge- remembering from past experience.

d) Extending outside self - venturing to relate 'stories' to others

e) Linkage of language experience to other activities in other settings
These tentative sub-categories are closely interwoven with the previous categories discussed. Re-working produced a merging of the category systems.

Subsequently I reduced the areas to the three major concerns of the study because these were the crucial elements which would explain what my thesis wants to know, i.e. what was actually going on during literacy learning periods:

**Category set 3.**

1. **How students cope with learning reading and writing**

   - Social interaction as language learning strategy
   - use of prior knowledge- social experience to interpret text or convey meaning
   - decontextualisation of meaning
   - use of sign systems - drawing to convey meaning
   - gaining control of language

2. **Their development of strategies to aid learning over time**

   - deliberate use of means to achieve literacy goals
   - use of scaffolding
   - use of support, environment, teacher, researcher, peers
   - place holding, temporary spelling , closer approximation
   - use of repetition to gain control
   - phonemic segmentation
3. **The role of the computer in the development of literacy learning**

- How the computer aids literacy progress

- Discovery of keyboard leads to letter recognition

- Relieving burden of motor control of pencil thus facilitating production of written work

- Immediate result seen on screen thus making the connection between action on keyboard and result on screen

- Editing, facilitates error checking and student can correct easily without having to re write the whole text

- Provides motivation to write and gives a sense of achievement when audience can read legible texts

I then tried to define more specifically what these broad areas encompassed. The process of categorisation was reiterative and the same elements kept recurring. This confirmed the validity of some of the tentative coding and eliminated others. Some elements also occurred within more than one category. The following categories were the final results of the refining process.
1. **How the students cope with learning reading and writing:**
   a) Use of picture association to find meaning
   b) Knowledge of symbols as representations of meaning
   c) Recognition that different symbols can have common meaning
   d) Knowledge that 'writing' can be 'read' back and holds its meaning
   e) Use of conventions: recognising the discreteness of words, and functions of spacing, punctuation, capitals, format; the use of syntax and grammatical structures
   f) Drawing as representational system
   g) Placeholding, the random or selective use of letters to represent meaning
   h) Asking for assistance, from researcher/peers/teacher
   i) Use of environment to provide information to assist in building word or sentence
   j) Copying from text or screen
   k) Use of social interaction as base for learning-modeling

2. **Their development of strategies to aid learning over time:**
   a) Decontextualisation of meaning as in the transfer of information across different contexts. Intertextuality (life to text, text to life or text to text) as a meaning making strategy. This occurs when knowledge from one context is transferred to another as in links with other texts and links with experience in life or links with other communication media. Linkage of language experience to other activities in other settings
b) Use of environmental print
c) Use of temporary spelling
d) Spelling by sound/symbol equivalence
e) Phonemic segmentation
f) Sight words, spelling by visual memory—remembering from past experience
g) Drawing
i) Use of repetition, of words, sentences, topics.

3. The role of the computer in the development of their literacy learning:
   a) Exploration of keyboard-facilitating control of letters & words
   b) Intertextuality
c) Accessing text, visibility of text on screen, reading back from screen
d) Communicating through the computer
e) Editing
f) Making connection between action at keyboard and result on screen

I had entered data in a database assigning elements to these categories over a period of time, changing the format as the categories and the approach to the analysis was modified. I also experimented briefly with a simpler way of applying broad categories directly to the student records data. This proved to be too superficial and I returned to the onerous but necessary task of assigning all the data to defined categories on the database.

As noted above a number of configurations were tried over time (see examples appendix 1) the final format was the result of considerable rethinking about what the important events were and how they could best
be drawn out and made explicit in the analytical process. The final form represented a breakdown of the range of behaviours observed during literacy learning and an attempt to identify how those behaviours influenced learning outcomes. The range of learning behaviours was the focus and encompassed the three key areas defined above. (See table 3) From these categories the coping strategies were identified, some of the categories were coping strategies in themselves which were more clearly defined within the database. The overlap of categories resulted in some repetition but served to show the linkage between environment, behaviour and social interaction in helping to develop strategies for coping with literacy learning.

**TABLE 3.**

**Focus: What is the Range of Learning Behaviours Which Occur in Each Literacy event**

<table>
<thead>
<tr>
<th>Copying</th>
<th>Writing &amp; composing</th>
<th>Social Interaction</th>
<th>Searching Environment</th>
<th>Editing Behaviour</th>
<th>Interaction with Computer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions: Accuracy: high/low</td>
<td>Purpose: assist in text being composed; provide subject for text; start text; copying for copyings sake.</td>
<td>Aspect: Implement: pen; pencil; computer. Independent or joint; unaided; Approximation; Placeholder; repetition; speech for self; Source of ideas: book; previous lessons; life experience; environment.</td>
<td>Initiated by: student(SI) others (OI)</td>
<td>Purpose of interaction: request for help; request for information. Topic of interaction: computer; literacy in general.</td>
<td>Self-directed,(SD) knows what to look for; Random searching, unsure what to look for. Source of print: chart; book; board; cards.</td>
</tr>
</tbody>
</table>

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From the recorded data, patterns began to emerge which enabled the interpretation of the data.

The information culled from the core data was assigned to the appropriate categories and typed into the data base. The 'Inferences Drawn' were those drawn from examination of the elements entered in the preceding categories i.e. 'Literacy Event; Student Roles/Behaviours in Event; Observer Roles/Behaviours in Event; Product of Event (see appendix 1 for detail). Classroom observations were thus coded to identify emerging themes and patterns and to provide information about the students' learning context. This partial analysis provided an overall picture of strategies and processes used and defined changes and benchmarks in the progress of the students' literacy learning. After examination of this first cut of the data, further categories emerged which were seen to be homing in and picking up the finer nuances of what was actually happening from the perspective of the students' literacy behaviours. In the final format the Observer Roles/Behaviours was subsumed into a new category 'Social Interaction' and the new categories of Copying; Writing & Composing; Using the Environment; Editing behaviour; and Interaction with the Computer were added.

The core data was then re-examined in the light of the new categories and assigned to the adjusted fields. The data base facilitated an in depth investigation of the way in which each student used the strategies that were demonstrated and the effect of scaffolding which entered the context through interaction with the researcher and others. Examination of the student records revealed interactions with teacher and peers and these were used in conjunction with the data base to form a composite picture.
Analysis of the core data provided the substance of the interpretive summary and subsequent theoretical framework presented here. The interview data provided substantiation in support of the core data.

Supportive Data Analysis

The teacher and principal interviews focussed on attitudes, knowledge beliefs and practices in relation to literacy learning and opinions of the use of the computer in the classroom. The parent interviews focussed on concerns about the education of their children. On changes observed over time in their children's behaviours in literacy learning and on opinions of the use of the computer in this context.

The hand written interview notes were typed on the computer and returned to the participants for checking before analysis proceeded.

When confirmed these were then examined for themes related to the beliefs, practices and concerns of the interviewed stakeholders related to literacy learning and the use of the computer in the classroom. The interview data provided cross checks of student responses and attitudes as well as stakeholders perceptions. These were based on Opinions; Attitudes; Beliefs, and helped to provide background information and to clarify some aspects of the data. This analysis provided supportive information for the core data and was used as a check on interpretations of classroom behaviours. Samples of interviews are to be found in Appendix 2. Student records are included in Appendix 3 and samples of the data base used for the analysis can be found in Appendix 1.
Steps Taken to Maximise Credibility and Trustworthiness of Data

To ensure credibility a longitudinal study in the class setting was the chosen model of operation. A short term investigation would not have recorded significant changes that might occur over the extended period of the study. Progress may be slow and intermittent with students labelled as learning disabled. For these students, as with other learners, as one aspect of learning is mastered it may be put on hold while other aspects come to the fore. It may thus appear that previous learning has been forgotten while new learning is taking place.

Criticism of naturalistic enquiry as not generalisable, replicable or objective abound in the literature. However, Guba & Lincoln (1982,1985) have proposed checks to ensure reliability which replaced the criteria applicable to experimental inquiry. These include 'prolonged engagement' and 'persistent observation'; checking back to the data source; triangulation with other data sources; an external 'independent audit' can be used to ensure that the enquiry has been carried out in accordance with good professional standards and that the findings are consistent with the raw data (Guba and Lincoln, 1985 p109).

Credibility (to replace the conventional experimental-internal validity)
In the naturalistic model this is assured by:

- *Prolonged observation* to enable identification of 'salient' characteristics;
- *Peer de-briefing* to ensure clarification of growing insights and to gain advice on emerging design;
**Triangulation**, checking against a variety of data sources to cross check both data and interpretation;

**Member checks**, to verify data with members from source groups;

**Applicability**: (Conventional experimental determines applicability by generalising - or external validity).

In the naturalistic model:

**Transferability** is used to determine the applicability in other contexts.

**Consistency** - if enquiry can be repeated in a replication in same or similar context. This is not often possible as repetitions of naturalistic design are difficult to achieve- settings change over time and participants also change, therefore Guba & Lincoln (1985) proposed the criteria of dependability using audit trails to delineate method and processes.

**Neutrality**: determining the degree of enquirer bias in the findings.

**Confirmability** is used rather than objectivity- this is achieved by triangulation (revelation of any enquirer bias through reflexive journals and confirmability audit by verifying findings back through to the original data).

Guba and Lincoln (1985) thus provided criteria for assessing the validity of findings of naturalistic enquiry along with a broadly defined model for enquiry.

To ensure maximum credibility and trustworthiness of my data and of my interpretations of the data I have endeavoured throughout this study to adhere to the methods outlined by Guba & Lincoln. This has been through prolonged and persistent observation, triangulation, peer de-briefing, member checks and verification from original data.
The following table shows the applicability of the checks to the methods adopted in this study.

**TABLE 4.**

<table>
<thead>
<tr>
<th>Criterion Area</th>
<th>Technique</th>
<th>Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credibility</td>
<td>(1) Increase credibility through (a) prolonged engagement</td>
<td>Data collection over a period of four years</td>
</tr>
<tr>
<td></td>
<td>(b) persistent observation</td>
<td>Range of thirty to fifty sessions of observation per student</td>
</tr>
<tr>
<td></td>
<td>(c) triangulation</td>
<td>methods and data sources triangulated</td>
</tr>
<tr>
<td></td>
<td>(2) peer debriefing</td>
<td>Monthly over the period of study</td>
</tr>
<tr>
<td></td>
<td>(3) negative case analysis</td>
<td>Not used</td>
</tr>
<tr>
<td></td>
<td>(4) referential adequacy</td>
<td>Not used</td>
</tr>
<tr>
<td></td>
<td>(5) Member checks</td>
<td>At intervals and at end of study</td>
</tr>
<tr>
<td>Transferability</td>
<td>(6) Thick description</td>
<td>Recording of detailed observations</td>
</tr>
<tr>
<td>Dependability</td>
<td>(7a) Audit/audit trail</td>
<td>During peer debriefing</td>
</tr>
<tr>
<td>Confirmability</td>
<td>(7b) Audit/audit trail</td>
<td>During peer debriefing</td>
</tr>
<tr>
<td>All of the above</td>
<td>(8) Reflexive journal</td>
<td>Notes recorded during study</td>
</tr>
</tbody>
</table>

After Guba & Lincoln, 1985, p 328.

The argument is often put that naturalistic enquiry lacks rigour however, Guba and Lincoln (1985) maintain it makes greater demands on the researcher than a 'comparable' study.

"The naturalistic investigator cannot confine his or her attention to a few variables of interest, ignoring the setting because it has been so carefully controlled; he or she must take account of all factors and influences in that
context. If anything may make a difference, then everything must be monitored." (Guba and Lincoln, 1985, p191).

In accordance with this, as far as possible, all factors which might have influenced behaviours and events were noted as set out in the protocols for observation.

Observers don't always see things in the same way, each person has his/her own particular perspective.

Guba and Lincoln, (1981, p97) state that

Two independent observers could thus not be expected to devise the same set of categories. The second judge ought to be able, however, to verify that, first, the set of categories makes sense in view of the data from which they emerged, and, second, that the data have been appropriately assigned within the category system.

If these criteria are met, then the methodology must be deemed to have "credibility" and "trustworthiness".

The categories used for the final analysis here were examined and critiqued by peers and supervisor in an ongoing process as they were being developed. A number of different approaches were tried during this period. These were modified and refined until I was satisfied that I had a system that would perform the functions required to enable the data to be examined fully. The categories had to be justifiable in terms of the data from which they emanated and the elements of the data assigned in a such a way as to retain the essence of the observations made. The method of checking employed was for the researcher and referees to examine the
categories until agreement was reached that they were consistent with the data. The next step was the assigning of the data by the researcher according to the 'mapping rules' devised. The results were then compared to check the efficacy of the system. After a series of iterations of this process the final categories and assignment rules were determined.

**Prolonged Engagement**

It is vital that the naturalistic researcher spends sufficient time to become familiar with the research setting and to establish rapport with participants and stakeholders and to establish an environment of trust. It is also necessary to take time to account for the disturbance caused by the researchers' presence and by their observations.

At the close of the investigation, I had more than four years involvement with the school and the stakeholders. There were various periods of contact with different individuals, but the prolonged period of contact had enabled the establishment of trust and acceptance throughout the school. I was invited to various activities and on a few occasions was asked to speak to staff members about the progress of the study and to assist with computing workshops for staff members.

I had also built up records for individual students of approximately eighteen months duration and had participated in many events and class activities. I was accepted by the students and always welcomed to their classroom. There is no doubt that 'an environment of trust' was established. The fact that I was allowed access to the school and to the classroom testifies to that.
Persistent Observation

Examining student behaviours in the context of the use of the computer as a writing tool in the classroom over such a prolonged period of time enabled the researcher to carry out an in depth study. This resulted in identification of strategies and patterns of behaviour related to literacy learning and allowed investigation of how the strategies are used in the learning process.

Triangulation

Triangulation is intended to provide a cross checking mechanism for accuracy and improve the credibility of interpretations. The following methods of triangulation were employed in this study:

Different Data Modes

Field notes
Hard copy of student work
Collated student records

Each provided a means of cross checking for accuracy and thus credibility.

Different Sources

Student interactions with researcher
Student interactions with Teacher/Peers
Student interactions with literacy events
Student interactions with environmental print
Student interactions with books
Student interactions with computer
All literacy related interactions and often linkages could be seen through the different sources providing the same information. For instance a student looking at a word on a poster, using it in writing on the computer and then finding it in a book.

**Principal/Teacher Interviews**

These provided information on and confirmation of the validity of approaches and perceptions of the study. Also they highlighted the effects of the project and the advantages or disadvantages to the participating students. It was a means of checking that there was agreement as to the direction and management of the program.

**Member Checks**

As I was the sole researcher it was not possible to establish a referential system as advocated by Guba & Lincoln with co-researchers. The Teacher and Principal Interviews were taken as providing triangulation and there were member checks carried out with them through interviews and periodic reporting and consultation.

In attempting to set up member checks with participants to establish credibility a difficulty arose in obtaining relevant feedback from the students. Some compensation for this was attempted by a system of consulting with the teacher, showing her the students work and discussing their behaviours with her. This often occurred whilst the student was at the keyboard and showing their work to the teacher so some student input was
inherent. At other times it would be whilst discussing hard copy. However this was not recorded, it was really a discussion of progress and achievement. This was valuable as it kept the teacher informed of the students work and I received feedback on the changes taking place. It also maintained the mutually supportive role that was adopted between the teacher and myself.

In writing a report on progress for a workshop I shared the data not only with the class teacher but with other teachers in the school. This was appreciated as often it was a good indicator for other teachers of the level of achievement they could expect, in the context of language, when some of the children joined in with other classes.

Fig. 3 Summarises Data Analysis Procedures.
Data Analysis Procedures

Fig. 3. Data Analysis Procedures.
CHAPTER 4

PRESENTATION OF RESULTS

Introduction: Restatement of Project's Aims

This investigation aimed to document and explore the use of computer technology to support literacy learning with students who have been labelled as intellectually disabled. The students who participated in the project were operating in the mild/moderate range of intellectual disability, (henceforth I.D. students). The focus of the project was their development of control of both the writing process and the use of computer technology. This focus generated a set of three specific questions which framed and directed the study.

* How does computer technology affect I.D. students' acquisition of writing skills and knowledge of the writing process?

* What is the range and nature of coping strategies that I.D. students use when learning to write with access to a computer as a writing tool?

* What are the implications for the use of computers in classrooms with I.D. students?

To address these questions a three and one half year observational field study involving a class of intellectually disabled primary school students was undertaken. The data collected during this period has been analysed in conjunction with research-based theoretical literature pertaining to literacy
learning, cognitive development, learning theory, special education and technology in the classroom. Three major organisational themes emerged from this analysis:

1. **Literacy Development.**

Information analysed from this thematic perspective related to growth towards literacy evidenced by the ability to produce readable text and to read from existing text. Growth was inferred from:

i. the development of proficiency in the use of symbols/words to express meaning

ii. progress in spelling, editing, and the use of the conventions of writing

iii. the composition of coherent text and the ability to read and construct meaning from text.

2. **Cognitive Strategies.**

Information analysed from this thematic perspective related to the processes of literacy development evidenced by:

i. the cognitive strategies observed to be used during literacy events which included:
   asking for help from others, copying, use of pictorial cues and print in the environment to aid text being composed; as a source of text; or as a source of ideas for text

ii. the cognitive strategies inferred to be used from observation which included:
   use of internalised/prior knowledge in composing text; linkage with life experience; previous lessons; experience of text in other contexts to provide ideas for texts; intertextuality as frame of reference and a meaning making strategy (the linking of concepts from text to life, life to text, text to text); the use of knowledge gained by experience with the computer to format texts.
3. Computer Use.

Information analysed from this thematic perspective defines the way the students progressed in their use of the computer and its functions as a writing tool. The use of the keyboard, the control of operating functions and the discovery of the functions of different keys and the way they were used in the writing process.

These themes were used as a framework for interpreting the data, addressing the questions which motivated the study, and developing a series of case studies. These were finally merged and synthesised into a grounded theory of computer assisted literacy development in intellectually disabled primary school students.

Because of the wealth of detail contained in the data and the consequent space demands it has been necessary to limit the number of case studies. Those presented here are of students who participated for a prolonged period of time and for whom significant numbers of observations were recorded. They are not all over the same period of time. Others for whom shorter periods were recorded have not been dealt with here.

For a few weeks prior to commencing observations of the use of the computer in the class setting I spent some time each week getting to know the class.

The students joined the host schools' infants class for language sessions, they listened to story readings in a group situation and sometimes students told stories themselves or recited poems. This was followed by a
period when the students drew their 'stories' in their language class work book (process writing). I participated in the language class, looked at drawings and listened to the re-telling of their stories (what their drawings represented), wrote the captions for drawings and assisted as they tried to 'write' themselves. The social interchange increased as I became an accepted member of the group and my presence became part of the normal class situation.

The routine was the same for all the students, generally in a one to one situation (but as an integral part of the class setting) for periods averaging twenty minutes per session (sometimes for ten minutes and sometimes thirty, depending on their attentiveness and their inclination to continue). I observed behaviours and engaged the students in conversation as they used the computer. I sat next to them as they worked at the keyboard, on a chair placed close enough to allow ease of observation. I placed my note pad on the bench next to the computer, with the abbreviated date printed at the top of the page. A typical session would commence with an exchange of good morning greetings and some conversation, perhaps about home or school activities, and any news they wished to recount.

I developed a number of scaffolding procedures allowing the students to build on a framework of support whilst encouraging them to develop their own skills and strategies.

These took the form of:

1) Asking "What would you like to write about today? What have you been doing at the weekend/ on your holidays/ have you been
anywhere you would like to tell me about?" as a method of getting the students started.

2) Prompting with letters when they hesitated or if asked for help especially in the beginning stages.

3) Printing by hand to help their texts and also printing the students orally composed texts as models they could copy from.

4) Asking "What do you think it is?" and prompting "Say it again, what do you think it sounds like?" if they hesitated or asked "What's next?" as they tried to spell.

5) Responding with comments and questions designed to encourage further development of text. For example when one student typed the names of school friends I would comment, "That's very good, you know their names", and ask "What are you going to write about them?"

6) Always made positive comments about students efforts to write "That was very good work", or "You are doing very well" and showed interest in the events they attempted to write about.

7) Listened as they read and encouraged by prompting if necessary by pronouncing with them or starting words and saying "What do you think it might be?" I also encouraged reading by asking "What does that say?" after a student typed a text.

8) Allowed the students to make decisions, giving them the freedom to try to write about things they knew. I did not offer topics, only suggested if they talked about a subject "You could write about that" or "Would you like to write that?"

9) Providing demonstration and information relating to computer functions when needed or requested.

There was no pressure on the students to perform but there was encouragement to engage in learning practices. The processes of literacy development that these children revealed in their progress in 'learning to mean' were illuminated by many instances of 'new departures' and changed behaviours. In this chapter I have endeavoured to present those events in a way which highlights the many instances and the different ways in which
these students showed how they progressed in their literacy learning using the computer as a writing tool.

To do this a number of 'Cameos' have been selected within each case study. The cameos describe events which highlight the raw data and provide clarification of the direction of progress and knowledge gained. They give clear evidence of breakthroughs or developments, particularly where one event illustrates a whole series of literacy gains. By relieving the narrative with these interspersed cameos and comments on their implications it is hoped that a clearer picture of the students will emerge for the reader.

**CASE STUDY 1**

Michelle

The other students had already been using the computer for a few weeks before Michelle joined the class in September, 1985. Michelle was six years old at that time. The class teacher, reported that she had been in another primary school for twelve months and had 'shown little sign of learning progress'.

Her primary school records indicated that she was considerably behind in all areas, was a passive class member who exhibited a reluctance to communicate. The reports of previous teachers and specialists also showed that:

* in a one to one situation she showed more willingness to perform tasks
* she had some word recognition skills but needed help to use them

* poor motor control presented difficulty in writing legibly.

The records also state that as continuous individual attention was not possible in the previous primary environment 'she had fallen significantly behind the rest of the class in all areas'. In spite of a number of interventions progress had been imperceptible.

Michelle had therefore been recommended for special placement after an assessment which indicated an overall delay rather than a specific deficit. She was diagnosed as having:

* a mild articulation disorder

* an expressive and receptive language delay

* short concentration span.

Her performance on standardised diagnostic instruments (WPPSI, administered 8.11.84, and McCarthy Scales, 17.7.85, -part of school records) indicated that she was functioning in the low mild/high moderate range of intellectual handicap.

At the beginning of the project Michelle was very shy and reticent for a few weeks and seemed withdrawn and uncommunicative compared to most of the children. However, she responded to some friendly conversations I initiated and by the end of September, after a period during which she observed other students using the computer, she made the decision to try the computer herself.
The data which was used to construct Michelle's case study was collected from 30 September, 1985, to 24 November 1988. It came from a total of fifty-two sessions of approximately twenty minutes during which I observed Michelle and engaged her in conversation as she composed text using a computer as a writing tool. The sessions have been organised into phases, each phase covering approximately one half-year period. This system of organisation was adopted for all case studies.

(To allow an audit of data, copies of student records are included in Appendix 3 and of products in Appendices 4-9)

**Theme 1. Literacy Development**

**Phase 1 - 30 September to 22 October, 1985.**

In this period I observed Michelle six times for sessions ranging from twelve minutes to twenty-five minutes. During these sessions she composed six single sentence texts, ranging in length from three to eleven words. These texts ranged over the following topics: personal information (her age), how she came to school, an imagined text of a drawing she showed, her recount of life events, an observation of the weather, information about her dog.

During her first session on the computer she informed me it was Monday and I typed that to show her how to use the keyboard. I asked her questions to get her started: "What is your name, how old are you?" When she responded I said "We could write that on the computer" and pointed out the letters of her name, she pressed the keys as I pointed to them. She typed her name again, she found the beginning letters herself then looked to me for help, I pointed out the end letters for her. She then attempted her name
herself and produced an approximation which had two letters missing. I typed 'I AM 6' after she told me her age, she copied this from the screen and found all the keys herself. She told me "I came to school on the bus and did my lessons", this was volunteered. She typed the first part of this text as I told her the letters and pointed out a few she could not locate, she used Q for O in TO but selected O in other words and she missed H out of SCHOOL. The last part of the text (italicised) was copied from my printed (upper case) version. I used upper case to avoid confusion as the computer keyboard letters were in capitals. (Later in this phase she showed she had little difficulty transposing upper and lower case letters as she copied from lower case print in her language workbook.) Michelle searched the keyboard for the letters and asked for help if she could not locate them. Occasionally she had a problem with g, h or t, and other letters whose form is entirely different in upper case or with letters which resembled others such as Q/O, I/l, J/l.

From this first session, it was evident that she knew letter names and sounds and could recognise both capital and small letters, and find most of them on the keyboard. She demonstrated this by her ability to copy accurately from print and to type correctly from spoken letter names. Sometimes she would hit an adjacent letter accidentally and produce an error which was due to innacuracy of motor control. One other error, caused by sound similarity was the use of W for U as I told her the letter names and she obviously related the 'U' sound to the 'W' sound. These problems seemed to have been overcome before the end of Phase 1. Evidence to support this was observed in session 7(18.2.86) Phase 2, when she typed j instead of l but realised her error, deleted and corrected.
In most sessions she copied the date from my notes in the abbreviated form i.e. for example 6.10.85. Often she told me what day it was and added that to the abbreviated date, copying from my print. Later in the project she copied the date in full from the board i.e. for example, Tuesday 6th October, 1985. Eventually Michelle typed the date independently in either full or abbreviated form.

To get her started in the first few weeks I asked her "What are you going to write about today?" If she did not have any ideas, I would prompt her with "What did you do at the weekend?" or "Have you been to any interesting places?" She responded with information about her activities.

Early in the project during Phase 1, Michelle used the computer mainly to copy from texts which she composed orally and asked me to "write it down". I printed her texts on my notepad and she copied from this onto the computer. During this period Michelle demonstrated that she was very dependent on my help. This dependency took two overt forms:

(i) she asked me to turn her intended text into written form so that she could copy it

(ii) she waited for assistance with letters supplied orally or pointed out for her.

This was the case with literacy events observed in sessions 1, 2, 3, 4, 6 in Phase 1.

Data collected from these literacy events showed that Michelle had the following literacy related knowledge and skills at this stage in the project:
(i) Knowledge that:

* spoken language could be represented in both written and pictorial form

* her own experiences could be recounted in both oral and written language

* written language was made up of various units ("words' 'letters")

* letters had specific names, sounds and shapes associated with them

* letter shapes had two forms (capitals and small). She knew from experience that some were very similar (c,s,p ) and showed by the problems she had finding letters such as g,h,b,t,n that the fact that some were highly dissimilar caused her some confusion when using the computer. Michelle soon learned to cope with the problems associated with this. She demonstrated this in session 10(11.3.86) when she asked how to change to big letters and experimented with the shift key, looking at the differences in the letters. I printed Bb Ee IL nN and pointed out they were the same letters although they looked different.

* written language proceeds from left to right

(ii) Skill in:

* orally composing a coherent text about her own experiences

* recognising some letters by name and associated sound in both capital and small forms

* accurately copying text from written form to keyboard

About one month later this repertoire of behaviours was added to in the following ways:

Firstly she began to use print in the environment as a source of text construction. I first observed this 1st October, 1985 (literacy event session 2), when she used her workbook as a source of text. This use of already existing
models of text spread to other sources of the environment and included books, posters, charts, illustrations, class information on the board etcetera.

Secondly, rather than waiting for me to write her orally composed text out so that she could copy it she typed her text directly on the computer, asking for help with spelling ("What's the next letter?")

It was during this phase also that she indicated that she was aware that meaning could be represented by symbols which could then be re-interpreted in another mode. For example in a literacy event in session 2(1.10.85) she explained her drawing and how it related to the meaning of the text "I would like to fly up in the sky". It is reasonable to assume that her use of the drawing showed that she was able to attach meaning to symbols.

Her subsequent explanation of how these meanings related to her text indicate that she knew exactly what her pictorial symbols represented and that she could transfer these meanings into another symbol system by transferring them to a print representation through the computer.

Phase 2, 18 February to 24 June, 1986

In this period I observed Michelle for a total of eleven sessions ranging from 15 to 25 minutes. During these sessions she composed seven single sentence
texts ranging from five to ten words, one of these was a two part sentence (session17, 24.6.86), she also copied texts from her workbook, charts and books. These texts ranged over the following topics: A visit to the circus, the Pizza Hut, who she played with, her birthday party, and colours.

During this phase the following literacy related behaviours were observed:
*Michelle correctly typed her first name directly without reference to any source. This mastery of her first name was the first completely independent typing achievement I observed. She moved from an approximation which missed out one letter (session 7, 18.2.86) to correct spelling to retrieve her file (session 8, 25.2.86), after this she continued to type her name to retrieve her file.

By April, there was evidence that Michelle realised that text could be formatted. In session 12(14.4.86) she began to separate topics or sentences by using a new line to start a new topic. It was also during this phase that I first observed the apparent regression behaviour noted by several researchers of young children's writing (Graves (1983), Calkins(1983), ). It was most obvious in Michelle's use of conventions such as spacing of words or sentences. Her use of such conventions seemed to be abandoned when other concerns were more important to the text. She was erratic in her use of spacing and upper and lower case in literacy events in sessions13(15.4.86), 14(21.4.86), 15(20.5.86), 17(24.6.86) when she focused more on the words in her attempts to convey meaning.

It was during this phase that I observed some evidence of Michelle's increasing skill in reading behaviour. For example in session14(21.4.86), Michelle copied some text which was already on her screen, read back words she recognised at sight, she sounded out the first syllable YEL of yellow and
then inferred (obviously from internal knowledge of words and the context of the text she was constructing) that the word was 'yellow'.

There was also further evidence of the knowledge and skills noted in the previous phase. For example, she further confirmed that she knew the meaning remained the same despite a change in text form (upper to lower case) in literacy events observed in sessions 7(18.2.86), 10(11.3.86), 11(18.3.86), 15(20.5.86), 17(24.6.86).

Finally in literacy events observed on 3.3.86, and 18.3.86, she demonstrated that she knew and could recognise some simple words such as CAT COT MAT TO THE I at sight.

**Phase 3, 8 July to 21 November, 1986**

During this period I observed Michelle for a total of six sessions ranging from fifteen to thirty minutes. During these sessions she composed fifteen texts ranging in length from four to twentyeight words and one to three sentences. These texts ranged over the following topics: Her posessions, her activities with her mother and her dog, she composed text to fit illustrations in a book, a description of snow, words and beginning letters, expression of a wish that she had feet like a duck to cope with wet weather, and a description of her activities while she was on a camping trip.

This phase was characterised by the following literacy related behaviours:

*Michelle continued to use a variety of sources of print in the environment - the screen, books, charts, as a source of ideas, as literacy models and for text to copy. In addition, she used knowledge gained in other contexts*
(intertextuality-life to text), her life experience and previous lessons as a source of ideas for texts.

*She began to take the initiative in deciding what she would write without prompting or questions to get her started. There were only three occasions during this phase when I did ask questions (session 19, 20 and 23) but even then for the first two occasions mentioned, 19(14.7.86), and 20(29.7.86), she had made her decisions for most of the texts and I encouraged her to continue. For example on 29.7.86 she typed four different texts and the only one which was not initiated by Michelle was a continuation of a theme from the previous session about an outing with her mother.

* Michelle became more communicative and began to expand her texts.

**Cameo 1**

In session 20, (29.7.86) she volunteered information and typed a complex string of related sentences about her dog which was entirely self initiated. 

She composed:

'MY DOG TINY DIGS IN THE GARDEN. WE PLAY WITH BALLS IN THE GARDEN TOO. I LAUGH AND SHOUT IT IS LOTS OF FUN, I LOVE MY DOG.

She elaborated the text as she thought about the time she played with the dog. The sentences were her own, showing that she had the ability to think abstractly and continue a line of thought, linking sentences in a coherent manner.

*The use of intertextuality in another form (life to text) appeared when she used previous lessons as a model for her text. For example her text about
snow 'SNOW IS COLD AND WHITE' (29.7.86) had been prompted by a news item that snow had fallen in the nearby mountains and by subsequent class discussion with the teacher. Her text about words starting with a selected letter (18.9.86) was also prompted by a previous lesson and supported by charts used in class.

*Michelle demonstrated that she could use her imagination and abstract thought.

Cameo 2

In session 22(30.10.86), when she composed a text which was not based on facts like her previous texts. She started by telling me that she got wet in the rain coming to school. In the conversation which followed she wondered how to keep from getting wet feet, she talked about ducks after that and we agreed that ducks liked wet weather. She said she thought if she had feet like a duck she wouldn't get wet.

She typed 'I WISH THAT I HAD DUCK FEET'

This text perhaps signalled her awareness of another purpose of text, which differed from recounts of events, informational texts, reports or descriptions. This purpose was to create imaginary worlds, to allow a departure from the known world, and to create text purely for interest based not on fact but on supposition.

During this phase she did not copy from her language workbook but fluctuated between copying from different sources and composing her own
text, mainly from life experience. She used support for her texts in the environment, and copied from existing texts, finding literacy models in books, charts, and from knowledge and experience gained in other contexts.

It was during this phase that I observed Michelle's increasing confidence in the use of formatting and editing her texts. For example (14.7.86) she used the return key to format her text so that it conformed to the format of the book she was copying. In session 20 (29.7.86) she used the return key to go to a new line to separate her topics and put stops at the end of sentences. She edited to correct errors in session 22 (30.10.86) by using the cursor moves to go back over the text and used the return key to separate topics and again used a stop appropriately at the end of her sentence.

Phase 4, 12 March to 7 May, 1987

During this phase I observed Michelle four times for periods ranging from fifteen to twenty minutes. (At this time she was attending various specialist classes and was often absent from the class.) During these sessions she composed six single sentence texts ranging from five to ten words.

This phase was characterised by the following literacy related behaviours:

* For part of this period she exhibited a desire to spell correctly and became much more tentative than she had been previously, checking to make sure each letter she typed was correct. For example in session 25 (19.3.87) she typed her name, but even with that she waited for confirmation that the letters were correct as she typed. Her text on that occasion was also completed with the same reliance on confirmation of each letter.
*Her vocabulary of sight words had extended, for example: I TO IS HAS A THE AND SCHOOL ON WE DID GO MY IT CLASS RED BLUE GREEN YELLOW. She also had the knowledge of where to check if unsure or she detected an error.

*She was still exploring the different modes of representing the date at this stage but she could type the date in full without reference to an external source.

**Cameo 3**

Earlier, in Phase 2, she had announced "It's Tuesday 5th May as she looked at and copied my abbreviated 20.5.86., in that instance she had translated the 5 as the fifth. By this stage, that kind of misinterpretation did not occur. In session 16(3.6.86), she recounted the information from the board "Today is Tuesday 3rd June" as she typed the abbreviated date 3.6.86. Another form of representation was adopted when she vocalised "7th of May 1987" in session 27(7.5.87) as she typed the date independently '7 may 1987'. (She checked the spelling of May on the board after she had completed it.) Later in the project in session 46, Phase 5 she clearly demonstrated that she was conserving the meaning of the different forms of representing the date when she typed the date as 23.6.88 but read out from this "Today is the 23rd June".

It is reasonable to assume that over a series of encounters with different representations of the date she had learned to correlate the stable elements within the different formats.

During this phase I observed that she seemed to be holding back sometimes, unwilling to take risks with composing, however, she did not copy from
existing texts such as her language workbook or books as an alternative. The
texts she did produce were her own but she was less independent, and
showed less initiative than she had done in the previous phase and needed
prompting with "Are you going to write about that?" when she told me her
news.

Her earlier behaviour of deciding what to write seemed to have been put
aside for a while. The changes in her behaviour during this period indicated
some apparent regression in her literacy development. As noted previously,
other researchers have observed this phenomenon as children deal with
new or different elements in their learning.

One possible reason may have been that there were other demands on her
time as she was attending some specialist lessons and I saw her less
frequently. Also, she had a computer at home by this time and I believe she
was using set exercise programs (drill and practice) which would require
correct responses and no initiative. She may have been expected to produce
conventional spelling. Her behaviour at this time suggested that she may
have been getting different messages about correctness to those generated by
the approach I took by encouraging all attempts to make meaning.

By April she seemed to recover some of her confidence and began to
compose again and to type without constant requests for affirmation of
correctness. For example in session 26(2.4.87) she typed a text about bringing
her computer to school. She asked for some help but attempted parts herself,
she then typed her own name and a friends without any hesitation(she
checked the spelling of her friends name on a chart after she had completed
it) then typed 'PE IS GOOD', the only assistance for this was saying 'good' with emphasis on the vowel sound.

**Phase 5, 2 July to 11 December, 1987**

During this phase, I observed Michelle seven times for periods ranging from fifteen to twenty-five minutes. During these sessions she composed thirteen texts ranging from four to sixteen words. Four of these texts were complex two-part sentences. These texts ranged over the following topics: Description of her activities in class, information about a friend's activities, information about class activities, personal information about classmate, information about her doll and her dog, information about bees, explanation of the reason she could not go swimming that day, observation of what happened when she bit into an apple.

This phase was characterised by a marked increase in independence. Michelle looked purposefully for ideas and support for her texts and again took the initiative in deciding her topics. She demonstrated her capacity for reporting events from life to construct text in session 34(11.12.87) when she told about seeing the doctor and the consequent ban on swimming because she had to have a hearing test.

*Michelle's increasing reliance on her own knowledge was demonstrated in session 31(29.10.87) when she asked Steven how to spell HONEY. Steven wrote 'Tony' on my notes and said "It's like Tony". She accepted his suggestion that it sounded like Tony, and typed HON but she thought there
was another letter and turned to ask for further help to confirm her opinion. I vocalised "HONEY" and indicated an E, she was satisfied then and completed the word.

*Michelle composed more complex sentences and descriptive text than she had produced previously. In sessions 28(2.7.87), 30(3.9.87), 34(11.12.87) her texts were extended. For example in session 34(11.12.87) she composed 'Michelle can't go swimming today the doctor says she has to have a hearing test'. This was an informational text but her next text composed during the same session was descriptive. She began each of these texts with her name 'Michelle had a juicy apple the juice ran down her arm', and although I prompted a little with the text about the apple the idea was hers.

By the end of October, 1987, Michelle was using temporary spelling confidently but she supported it with other checks if necessary, as an example:

**Cameo 4**

In session 31(29.10.87) she typed 'MICHELLE IS DOING JOT(lot) OF WOC(work) AT SCOOL(school)' She used J for L and did not correct it. She needed help with ING on the end of doing, she used a j instead of l in lot but pronounced the rest with just a little prompting. The class had been talking about bees and she told me 'They make honey'. She then typed 'BEES MAC HONEY', she asked for assistance with the ending of honey but started it herself with HO and then we pronounced it slowly and she
completed, with some help from Steven, she decided on N herself then checked with me to decide on EY. She then said "My dog is orange and black" and continued typing 'MY DOGIS' (she pronounced D-O-G slowly, started O for orange then asked for help. She typed ORA, using the sound of the word to help, then needed help for NG then I added E for her. Michelle can type AND from memory but needed help with black, we pronounced it together emphasising phonemic units and she typed this from the sounds. She said "His name is Tiny Tim" and copied 'TINYTIM' from the screen above.

The failure to correct J to L appeared to be a regression as early in Phase 2, she corrected this same error, however, she composed and typed in this instance without any external assistance and was concentrating on the composing. This kind of regression in one behaviour while attention is given to other concerns has been noted in a number of studies (Clay, 1979 and others). In the same session she used external support for her other texts, peer assistance, researcher assistance, phonemic segmentation, print on the screen, use of the environment. In this one episode she demonstrated a range of behaviours she used in composing text.

During this phase she continued to demonstrate reading skills as she identified words she required in the environment, on charts, the screen, the board and read from books, sometimes using pictures to aid her reading and sometimes identifying known words in print.
Phase 6, 10 March to 23 June, 1988

During this phase I observed Michelle twelve times for periods ranging from fifteen to twentyfive minutes. During these sessions she composed fifteen texts ranging from three to ten words and one to two sentences. The topics of these texts covered: Information about her dog, personal information, recording her experience of seeing the Tall Ships, information about friends, report about Easter, gift for her mother on Mothers day, comments about weather and her activity in the rain, report about absence/presence of class member and names of class members.

During this period of observation I noted that her previous literacy behaviours had been extended, for example, increased complexity of sentence structure, and greater utilisation of resources in the environment to suit her own purposes. Established behaviours such as the use of the sound of emphasised syllabic units, the use of existing texts and asking for assistance continued.

*She demonstrated that she was attending to conventions in session 36(17.3.88) in her text about the Tall Ships as she put a stop at the end of the first sentence and used return to move down to start the next part.

*Sentence structure became more complex, for example:
Cameo 5
In session 41(11.5.88) Michelle responded to my suggestion that she write information about the weather which was on the board. She did not copy as she already knew the words. 'IT IS A SUNNY DAY' but she added her own secondary phrase 'I LIKE THE RANY DAY' expressing her own idea. She continued the theme the next week when I commented on the rainy day, she told me she liked to jump in puddles in the rain, elaborating her liking for the rainy day.

She used an existing text from the board to start her text but gave it a different context by adding her own thoughts to produce a completely new text. She was obviously able to think abstractly and to carry an idea through and to expand it. Michelle took control of her text and revealed an independence of thought, an understanding of subject content, and ability to change text to express her meaning. This was also observed in session 40 (5.5.88) when she changed her orally composed text "I got a bird for mothers day" to 'I GOT A BID FOR MY MUM'. The purpose of the informational text was to make it clear that the bird was for her mother the fact that it was a gift for Mothers Day was embedded in the original text.

Michelle continued to alternate between playing safe, (typing words she knew and using previous texts as a starting point) and using environmental support and the sound of words to assist her with temporary spelling in composing new text. For example in session 38(14.4.88) she typed her text, using sound to help her spelling but looked around the room for a poster
and copied 'Easter'. She could recognise the word she required from its context.

Phase 7, 27 July to 24 November, 1988

During this phase I observed Michelle on six occasions for periods ranging from fifteen to twenty minutes. During these sessions she composed four texts, ranging from three to six words, sometimes these were not complete sentences. These texts ranged over the topics: trees, friends, the sun, information about a classmate.

During this period Michelle seemed to be avoiding composing. During the first three sessions, she copied some words from charts, the screen, books and previous texts and typed others from memory. She was compiling a series of words but making no apparent attempt at a story line. A possible explanation is that she was increasing her store of sight words as she obviously recognised and could read these words. Cambourne and Turbill (1987), observed a similar behaviour in young children learning to write. It was not until sessions 49(25.8.88) and 50(10.11.88) that I observed any attempt to compose coherent sentences. When she did compose she used the strategies previously identified, copying, sounding words slowly to emphasise phonemes, used the environment and asked for assistance.

*By this stage Michelle could read back previous work on the screen, session 49 (25.8.88), 50 (11.1.88), 51(17.11.88), in earlier stages, she had picked out isolated words she recognised, then gradually improved her competence
and was able to read back her texts. A clear indication that she was not just 'recognising' words by sight, but was reading for meaning came in session 47 when:

**Cameo 6**

In session 47 (27.7.88) she read from the screen the words she had typed but made no attempt to 'read' Emma's placeholder letters 'DXGFS' but asked "What's that?".

This suggested that she was aware that the particular letter arrangement DXGFS was not an allowable word unit in the language that she used. It follows therefore that she could recognise acceptable phonemic or orthographic units and was perhaps decoding some of the words that she read as well as retaining some in short term memory.

* Another behaviour reported by Cambourne & Turbill (1987) was observed at this stage when she typed a word she knew and constructed a text around the subject word. This was illustrated in session 49 (25.8.88), she typed the word SUN using an illustration on a chart as a source for the idea and added 'IN THE SKY' to form a text. She could also add further information to a beginning sentence, for example, in session 50 (10.11.88), she started with 'EMMA IS FREN' then added 'PAMELA IS TOO'.

*Michelle took control in session 49 (25.8.88) when she reversed roles first by instructing me how to delete an error she had detected then she gave me information on where I could find the word 'ZEBRA', and lastly asked me to type her text as she dictated the spelling.*
N.B. Michelle again displayed her confidence when she took charge and became the 'instructor' correcting Rickys work when they visited the class and composed a joint text (3rd March 1989). She was exerting her authority as a more expert writer.

**Theme 2: Cognitive Strategies**

It is unavoidable that many of the events noted in the above data are also noted here, however some points require discussion in a different context. As Michelle advanced in her literacy learning experiences her developing strategies supported her attempts to gain control of written language and to construct meaning from text.

**Phase 1**

In this phase Michelle demonstrated that:

*She could ask appropriate questions for example in session 2(1.10.85) she asked where the stop key was when she wished to use it. She asked for assistance when she needed information.
*She used life experience and prior knowledge to compose text. This was demonstrated in session 3(10.10.85) and session4 (15.10.85).
*She was aware that resources in the environment could provide literacy models. For example Michelle's use of her drawing as a subject of her text session 2(1.10.85).
She used the strategy of pronouncing some words, emphasising syllabic units and obviously using the sounds to help her spelling. I first observed this behaviour in a literacy event session 5, Phase 1, which occurred on the 21st of October 1985, when she typed her text partly with help, asking me "What's the next letter?" and partly by trying to identify the letter herself from the sound of the word. She approximated HS for HIS in this way. This appeared to be the beginnings of the phonemic segmentation strategy identified by Cambourne & Turbill (1987). I observed the same behaviour in literacy events in sessions 9(3.3.86), 11(18.3.86) and 13(15.4.86) in Phase 2 and more frequently later in the project.

Phase 2

In this phase evidence that Michelle was relating knowledge gained in one context to other events appeared, for example in session 16(3.6.86) she said "Tuesday 3rd June" as she copied the abbreviated version 3.3.86 from my notes. She obviously knew that it represented the day and month as she related it to her internalised knowledge of the date. She also understood that the day or date could be used as a marker for a specific event and linked Tuesday with the use of the computer.

*Michelle demonstrated that she could read some words. Evidence that she was reading back her text from the computer and transferring learning was first noted in April 1986, (session 14), when she read back 'red' from the screen, this may have been held in visual memory, but to decipher 'yellow' she sounded out YEL then added the ending from internalised knowledge of
the word. She was using her own resources for independent learning and showing evidence of generalising the knowledge she had gained in the class unit on colour.

Cameo 7

In session 17 (24.6.86) when Michelle pointed out two L's in her name, then tried to apply a 'rule' in the use of double letters in 'COLLOURS'. She copied from a poster on the wall and put two l's in colour but then corrected it. She switched from upper to lower case and put in all spaces except one. 'THE COLOURS are in the sky red and yellow and purple.' She put a stop at the end of the sentence.

She could see that the rule did not apply when she looked at the chart spelling and quickly rejected her hypothesis that l's should be repeated. She was obviously testing her own theory, evidence again of independent learning and her control of a process for hypothesis testing. This evidence goes against theories that intellectually disabled children do not generalise or effect learning transfer. In some of the other case studies there are instances which also indicate that they do indeed generalise their literacy learning.

*Michelle's use of the print resources of the room to help her to construct texts expanded to include the use of charts/posters, and books. In literacy events observed in sessions 7(18.2.86), 14(21.4.86), 15(20.5.86), and 17(24.6.86) for example she used wall charts, a book and a poster, whereas previously
she had used her own language workbook in sessions 10(11.3.86), 12(14.4.86), and the computer screen. She also added to the ways in which she drew on these resources. I had observed her using print to assist her spelling and/or letter formation on a number of occasions, but during this phase she also began to use environmental materials as a source of ideas for topics to write about. She used the print associated with a unit on colour the class had previously completed as a source for ideas on a number of occasions (literacy events sessions 7 (18.2.86), 14(21.4.86), 15(20.5.86), 17(24.6.86).

She also referred to the board as a source of information, and in session 16(3.6.86), she recounted the information from the board "Today is Tuesday 3rd June" as she typed the abbreviated date and used the day and its association with the computer to provide a source of text.

*Michelle exhibited independent learning quite clearly when she pursued the matter of using the shift key to change from "big to little" to conform to the print she was copying from a chart in session 7(18.2.86), in this case, she asked for assistance to achieve her aim.

*She continued to use 'speech for self', using the spoken word to aid her spelling in much the same way as students observed by Graves, Calkins, Sowers, and Harste, Burke & Woodward in their studies of young children learning to write.

*Harste, Burke & Woodward, (1984, p 96) suggest that there are three sound to letter strategies employed by beginning writers "(1) spelling the way it sounds; (2) spelling the way it articulates and (3) spelling the way it sounds out." They suggest that more than one of these strategies may be involved in the spelling of a word. They also point out a fourth strategy "the letter
name strategy" where the name of the letter coincides with a word sound such as R for "our" or as Ricky used it R for "are".

Evidence of the use of these strategies appears throughout the data.

It was during this Phase, in session 11(18.3.86) that I observed Michelle's first independent attempt to type text other than her name. This seemed to be linked to her increasing use of phonemic segmentation as a strategy for dealing with the spelling of words. However it seemed that she was concerned about spelling accuracy for she needed reassurance and pointed to the letters before typing to check if she was correct, reverting to the safer 'copying' strategy after the first two words I LIK had been attempted using the sound of the word. A possible explanation for her worry about incorrect spelling may have been related to parental expectations of correctness.

*Evidence of one form of intertextuality(text to life) appeared during this phase:

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**Cameo 8**

In session 7(18.2.86) when Michelle related the concept 'little' from her text to life experience. She had copied 'RED' from a chart, then asked how to change to small letters to conform to the printing on the chart. She typed 'red', looked at the two words on the screen and said "Big and little". I printed 'big' at her request and she copied that, then typed 'little' with help from spoken letters. She then said "My dog is little too" and asked for help to write that, but she decided that 'dog Tiny' was what she wanted, I printed the two words for her to copy.

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In this episode, Michelle demonstrated her ability to transfer, she linked the concept of 'little', from text to the change of letter forms and also linked to life in applying the concept to her dog. This was a clear instance of intertextuality (text to life).

Phase 3

During this phase Michelle continued to use the strategies of copying, asking for help, 'speech for self', and use of print resources in the environment she had displayed previously. In fact, she employed all the coping strategies (except the use of random letters) identified by Cambourne & Turbill (1987) in classroom research in regular classes.

*Michelle copied directly from books to provide a source of text, and used charts, the board, the computer screen and classroom equipment to help her construction of text as for example in sessions 18(8.7.86), 19(14.7.86), 23(21.11.86) 20(29.7.86), 21(18.9.86).

*She continued to employ the strategy of phonemic segmentation but in this period did not use temporary spelling, (except in session 22 (30.10.86) when she checked and corrected AD to HAD) but either completed correctly herself or asked for assistance with letters.

* It was also evident in this phase that Michelle had the ability to think in abstract terms and could follow through an idea leading her to make connections with other related concepts. For example in session 20 (29.7.86) Michelle composed from life experience, she carried through a line of thought, expanding her text by linking related sentences describing how she
played with her dog. Further evidence of abstract thought was observed in session 22(30.10.86) in her text 'I WISH THAT I HAD FEET LIKE A DUCK' prompted by a comment that duck's like wet weather.

**Phase 4**

By this stage Michelle had extended her vocabulary of sight words but also had the knowledge of where to find the information she needed if she did not know a word she wished to use. For a time, during this phase she exhibited a reluctance to take risks and constantly required reassurance that she was 'right'. A possible explanation was that she was getting different messages about correctness in other settings that caused this fear of errors and a departure from her attempts at independent temporary spelling. She continued to use the strategy of pronouncing slowly and emphasising syllabic units to help her spelling.

*She used phonemic segmentation even though she constantly asked if it was 'right' before she typed. By April she had recovered her confidence and was prepared to take risks again, she resumed her attempts to spell from sound without relying on constant affirmation. For example session 26 (2.4.87) she typed 'PE IS GOOD' asked for assistance but completed herself, the only prompt I gave was to emphasise the long OO sound and she made the connection without further help.

* Michelle consistently used the environment to assist her composition of text but by this stage she typed familiar words before she searched purposefully for them to check her spelling. For example in session 27(7.5.87) she typed colours that she liked, then checked the spelling of
yellow and green on a chart but she had spelled them correctly, red and blue she was confident of and did not check. She used the format of the rhyme 'red and yellow and blue and green', she did not need to check 'and' it was already in her sight word vocabulary. She demonstrated by her actions that these colour words had reached the 'sight word' category. (Graves, in R.D.Walshe, 1981,p 58).

**Phase 5**

During this phase I noted a return to the confident exploitation of the environment I had witnessed in Phase 3. I also observed evidence of Michelle's increasing independence of thought during this phase. She continued to use the strategies of asking for help and phonemic segmentation and temporary spelling noted earlier. In fact once she had established a strategy she continued to employ it, sometimes she would use some more than others, for example at times when she avoided composing she would revert to copying text. There was therefore some fluctuation in her use of the strategies she employed but they were always there when she wished to use them.

*She used the environment as a source of specific words to support her text and searched deliberately for required words. For example, she searched the screen for her dog's name (29.10.87) when she decided to write about him, she knew where to look and what to look for. She also used the environment as a source of ideas to start texts for example her workbook which was used as the source of the text (2.7.87) and a book from which she copied a text (5.11.87). In this way she used different elements in the environment for specific functions.*
*Michelle initiated topics and made more sophisticated use of resources in the classroom than she had done previously. For example in session 28(2.7.87) she used only the focus from her drawing in her language book and produced a text which described what she had done in process writing ('Michelle W... did a picture of her house') rather than copy the caption on her drawing. It seemed that she had come to realise that not only could she copy from existing texts but that she could exploit existing texts to produce new ones. This was an instance of intertextuality as defined by Kristeva (1969), cited in Parkes (1990) p32 'the text depended on another text that it absorbed and transformed'.

* Use of temporary spelling was again evident in the texts constructed during this period.

* She continued to display evidence of intertextuality, as she transferred concepts from life to text /from text to life and text to text to support her progress in literacy. She used topics and knowledge gained from previous lessons to provide ideas for her texts. An example of intertextuality (life to text) was observed in session 31 (29.10.87) when Michelle composed a text 'BEES MAC HONEY'. This was prompted by a discussion of a previous lesson in which they had been learning about bees, thus she used words and concepts she had encountered in a different context to form the basis of a new text.

Cameo 9

*In session 28 (2.7.87), Firstly she showed the drawing in the book which was labelled 'This is Michelle's house' and said 'That's my house'. She then typed her name and a new text 'MICHELLE W...... DID A PICTURE ABOUT HER HOUSE' (with some assistance).
The new text described what Michelle did and gave the original subject, her house, a new context. It became the subject descriptor in a text conveying the message that she had drawn a picture of her house. She had transferred the concept 'Michelle's house' from one text and used it as a base to create an entirely different text. Another example of intertextuality (text to text) was observed when she used her workbook as a source of an idea for text but composed a different text to the caption on the drawing to suit the purpose she wished to use it for.

*She returned to 'safe' copying at times then started to take risks again when she was ready. For example in session 28, noted above, her first text was accomplished partly by sounding words to help her spelling, partly by asking for help with the longer words and some words she knew from memory. The other two texts composed during this session were copied from my print after she asked me to write them down.

**Phase 6**

Michelle continued to use the previously noted strategies to aid her construction of text, exploiting the environment, phonemic segmentation, asking for assistance and using prior knowledge. There was also further evidence of intertextuality during this phase.

*Michelle clearly displayed intertextuality (life to text) for example in session 36 (17.3.88) when she linked her own experience of a visit to Sydney to see
the Tall Ships to illustrations and posters in the classroom. The posters depicted the Tall Ships in Sydney Harbour for the Bicentennial celebrations. She made the link between experience and the pictorial representation of events. She then used print in the environment to assist her to transfer her experience to text.

Evidence of independent learning was apparent in sessions 35 (10.3.88), 36(17.3.88) 37(24.3.88) when she used different ways to record the date she demonstrated her understanding of the concept that the date represented the day and the month and the year. By this time she could type the date independently but often copied from my notes as a matter of routine.

**Cameo 10**

*In session 35 (10.3.88) when she asked for help for the ending of 'WITH'. I provided scaffolding by telling her "It sounds like THE". With this assistance she completed the word.*

Michelle showed that she was able to associate complex sounds from known words and relate them to sounds in new words. With this support she was able to access her own knowledge to build her text. With help, she could solve the problem, she had the knowledge, but needed assistance to access it. This demonstrated the principle of Vygotsky's Zone of proximal development.

During this phase Michelle built on her previous experience and maintained the knowledge and skills evidenced in earlier periods. Towards the end of this period she typed names as a starting text and added information about her classmates. She read back from the screen and
updated a theme to give current information in session 44 (2.6.88). She used previous text on the screen and sounded beginning letters of words to help her construction of text.

Phase 7

During this period Michelle again exhibited some reluctance to compose and copied from illustrative charts, books, the board and the computer screen to construct texts. She did compose a few simple texts but used existing texts for support, as in sessions 49(25.8.88), 50(11.11.90).

*Evidence of her use of intertextuality (text to life) again appeared in session 48(18.8.88), when she typed the word 'apple' from memory after looking at an illustration of an apple, then pointed to a tree on the chart and talked about trees. She linked the concept 'growing on trees' to her text, and said "apples grow on trees" then added 'trees' to her text using knowledge from another context which had been brought to mind by her original text.

Theme 3: Computer Use

The literature suggests that using the computer is motivating and non-threatening. Olsen & Sulzby, (1990), in a study with kindergarten & first graders found that an exploratory period in which the children focused on the functions of the computer and software rather than on composing occurred.
The children in this study also explored the computer. In my original notes I indicated that Michelle did not explore the computer, I now realise that this was not true. However, her exploration was not by trying out keys to see what happened but by asking questions when she needed to know how to achieve something or by observing what I did and then adopting the process herself as in starting to use return to go to a new line. This seems to indicate that she needed a scaffold to explore. She was not prepared to 'Do and learn' from experience but she was prepared to learn by questioning, observing, and modelling.

Some of this learning was directed at solving particular problems. For example she asked where the stop was, and how to go to little letters. She would look deliberately for what she wanted on the keyboard independently but did not try out keys randomly to see what happened. She focused on the functions of the computer which she needed at the time.

Michelle approached the computer cautiously at first but soon came to understand that what she did controlled what happened. She made the connection between keyboard action and result on the screen from the start and over the period of time she was involved the following behaviours were observed:

*observed what happened on screen when she pressed the keys

* recognised errors, for example in session 7(18.2.86) she typed j instead of l and when she saw it on screen she realised her mistake and corrected to l

*used the text on the screen to aid spelling
composed new texts from existing texts

demonstrated her progress in reading by reading back from the screen.

Phase 1

During this phase Michelle searched the keyboard carefully, she could find most letters on the keyboard without difficulty. Occasionally at first she would ask for help if she had looked and missed the letter. The fact that the keyboard letters were capitals did not present a problem except with letters whose format was quite different in lower case (G, H, T for example).

*She used the delete key without hesitation and the space bar with some prompting at first for example session 1(30.9.85), 3(8.10.85) 4(15.10.85).

*She asked where the stop was when she was copying the date which contained stops, in session 2 (1.10.85) and continued to use it after that when needed.

Phase 2

Michelle typed her name to retrieve her file by this time. She was aware that this action retrieved her previous work. She mastered the use of the shift key over a period of time, eventually using it more consistently as she came to grips with the conventions of usage. From the start she understood the discreteness of words and controlled the use of spacing over time. It would be forgotten often when other matters such as the composing process, text structure or spelling concerned her more. She progressed well, sometimes using a range of functions with confidence and at others seemed to regress
and forget to use her newfound proficiency. It is normal for young children when attention is transferred to new concerns for established skills to be put on hold while new learning is dealt with.

*At this stage Michelle started to use the return key, modelling my action to move down a line at the end of a topic. For example, in session 7(18.2.86). This too was used inconsistently for some time.

*She asked how to get "little" letters to conform with text she was copying for example session 7 (18.2.86), she again asked how to change the letters in session 10 (11.3.86) but after that used the shift key independently when she felt it was needed. Sometimes her key manipulation was not successful and her text would show this as in sessions 11(18.3.86), and 12 (14.4.86).

*Michelle continued to use the space bar fairly consistently in sessions 7(18.2.86), 8 (25.2.86), 9(3.3.86) but abandoned it to attend to other concerns in sessions 10(11.3.86) and 14(21.4.86).

*She often corrected her own errors independently, mostly as she typed, showing her recognition of mistakes and that she was aware that they could be corrected for example session 8(25.2.86).

*Michelle typed her name to retrieve her file in sessions 12(14.4.86), 13(15.4.86), and 14 (21.4.86) and continued to do this consistently throughout the project.

*She used a stop at the end of the sentence for the first time in session 10(11.3.86), she had continued to use stop as she copied the date and found the stop key herself after looking along the rows of keys but this was her first use of punctuation.
During this phase Michelle's learning curve with regard to use of the computer was at its steepest as she encountered the various operations that she needed for her writing. In later stages she gradually mastered the functions she needed and the knowledge gained in this phase was put to work.

Phase 3

Michelle's computing skills included: the use of the delete key, spacing, the use of the return key to go to a new line (formatting), use of the shift key to change from upper to lower case and vice versa, and retrieval of her file by typing her name. She also used the stop key appropriately at the end of sentences, but again, this was used intermittently.

Michelle could insert the disks in the drives to start up, but this only occurred if she was the first on the computer.

* By this stage Michelle had no difficulties with finding letters or using operating functions.

* Michelle used the editing procedure of moving back over text using the cursor keys instead of deleting text. This was done following my instructions in session 22(30.10.86)

Phase 4

During this phase Michelle could operate all of the function keys to retrieve her file, and could also select the menu options to save her file, following instructions to do so. She was familiar with the use of return, the space bar, the shift key and punctuation keys.
Michelle indicated that she would like to complete the retrieval procedures herself in session 27(7.5.87). I read the words on menu bars as I pointed to them, and she said them with me as I explained what was to be done. She followed my instructions on which menu options to select to complete the operating procedures. Michelle then typed her name independently to retrieve her own file.

Phase 5

Michelle continued to consolidate all of her previously acquired skills. She was able to operate all of the functions she required and could follow the procedures to print if she was present at the time of printing.

* Her use of the space bar was sometimes erratic for example session 30(3.9.87), 31(29.10.87).

*Michelle did not always use return to separate every topic, for example session 28(2.7.87), 29(19.8.87), 31(29.10.87).

Phase 6

*Michelle identified errors in earlier texts and revealed that she was aware that corrections could be made whenever she chose. She demonstrated this when she decided to leave an identified error to be fixed another time. session 37 (24.3.88).

* Her use of the space bar was stable by this stage, occasionally she would omit one in error but mostly realised and went back to insert. For example sessions 35(10.3.88), 36(17.3.88), 41(11.5.88), 42(19.5.88), and 44(2.6.88).
Phase 7

Michelle attended to computer functions as she needed to use them. Her control of function keys progressed steadily, mostly self-initiated as she asked how to do something or observed then copied my actions. During this period Michelle continued to use all of the computer functions that she required for her writing.

Throughout the period of the study Michelle used the computer as a writing tool. It should be noted that her use of the computer was not entirely independent as the time limits and the nature of the class setting precluded that kind of usage. However, she was capable of operating the machine, of switching on and inserting disks when necessary. It was not intended to teach computer operation but to investigate the use of the computer as a support for literacy learning and as a writing tool.

It should also be noted that in the early stages at the host integration school, it was observed that the students did not relate the printed sheets to their activities on the computer even when printing followed immediately on their completion of a session. It was not until later in the project when the home school had established a computer room with printing facilities and the students were using it for other purposes that they became interested in the hard copy products to show the teacher and to take home to show parents.

It was not always possible for printing to be carried out immediately as using a printer involved longer periods of time in the classroom or going to the separate computer room when the sessions finished. Additionally the
computer room was not always available at the time, consequently there was some delay between writing and printing. It was my practice to take a printer to the room at intervals to print out for the teacher and parents. At these times I would print the students work for the day as they completed it. At other times in the computer room or using my own facilities I printed all of the material for each student as a record for teachers and parents as noted elsewhere.

Summary

In the period of time Michelle was involved in the project she used the strategies identified by Cambourne & Turbill in regular classes 'Coping with Chaos' (1987) with the exception of placeholding. Michelle did not placehold in the sense of representing words with unrelated letters. She went from copying to recognisable attempts to put a word together. A possible explanation is that she was already past the stage of placeholding when she came to the project because she already had a good knowledge of letter and sound associations.

Michelle's early coping strategy of copying her text directly from my written transposition of her orally composed texts was useful. Firstly, it aided her introduction to the computer and the use of the keyboard. Secondly, it provided an insight into the literacy related knowledge and skills she had at the time of entry into the project. After this initial reliance on someone to write her texts so that she could copy she began to use a range of cognitive strategies to aid her writing. She continued to request help in the form of
written words or whole texts but she had other resources which she
exploited as she sought to express herself in writing.

One of the first strategies Michelle used, and one which continued
throughout the period of the study was asking for assistance. Michelle asked
for assistance when necessary from peers, researcher, or teacher but she did
not rely totally on responses. She knew that help was available and could
ask appropriate questions but she also made attempts to solve problems
herself, for example sessions 5 (21.10.85), 13(15.4.86), 24(12.3.87), 26(2.4.87).

The strategy of sounding words out loud, using phonemic segmentation to
help her spelling was first observed in Phase 1 and continued throughout
the period of her participation in the project. Sometimes with prompting
and sometimes by her own efforts she pronounced words and used sound to
aid her spelling. This of course resulted in some approximations with
temporary or (as it is often termed) invented spelling. "Invented spelling is
really invented and new every time. When a word comes up again it is
invented again" (Bissex cited in Sowers 1981, p 38). This was observed to be
the case in Michelle's treatment of the word sick firstly as SIC then later SIK
according to Graves (1981), this would be considered to be a 'word in
transition'. At the other end of the scale, her repeated use of the temporary
spelling of LIK would be placed in the category of 'stable inventions'
(Graves, in R.D. Walshe (Ed) 1981, p 58). Eventually she began to
approximate independently and would check spelling in the environment
after she had made her attempt. This was using the environment as a
support for her text.
She also made use of repetition, returning to the same themes or words a number of times as she progressed from copying to approximating to retaining in memory. Over time Michelle expanded her texts in different ways as she gained control of more words and ways of composing texts. A singular example is the way she returned to the subject of her dog. These texts were all different, sometimes motivated by an association of concepts, but each attempt added a new dimension to her text. They became more expressive of her feelings. She produced more complex descriptions of his appearance and behaviour and expressed her own responses to the dog's playfulness. She exhibited a vocabulary expansion and an ability to express herself which was not due to lists of supplied words. Although there were often words on the board and she would use these in context, she was not reliant on set lists of words. She utilised those that were available in the environment if they suited her purpose but she had her own fund to draw on too. Her life experience was providing her with that fund and she made good use of it.

Michelle's writing was mainly factual but there were the odd flights of imagination such as 'I like to fly up in the sky' and 'I wish that I had duck feet'. In these instances she showed her ability to improvise ideas, as well as report events or observe facts and to use abstract thought. Her admission that she liked to jump in puddles in the rain was an expression of something in her character you would not have expected from her generally quiet, timid demeanour.

Michelle used the cognitive strategies of copying, and using the environment, both permanent and temporary (temporary as in independently using information from my notes). She was extending her
vocabulary of known words and she knew how to search the environment - books, charts, board, screen, other sources, to check when she was unsure.

The way she used the environment evolved over the period as her strategies became more developed and purposeful. She first began to utilise environmental sources to aid spelling and text in process. She also used existing models as a source for text construction. When she decided on a topic and needed specific help for words she developed the strategy of looking in places where she could find that specific help. Finally, she realised that she could scrounge ideas for topics for the composition of text from a variety of sources in the environment. She continued to use the environment in all of these ways throughout the project, each additional use added to the ones before.

Michelle combined the use of print and illustrative cues in constructing meaning. One generative strategy was to use a focus word or phrase and build text around it. For example sessions16(3.6.86), 17(24.6.86), 28(2.7.87), 36(17.3.88), 41(11.5.88). Michelle also displayed a behaviour of copying words which she could read but with no apparent attempt to produce a coherent text. This may have been a form of spelling practice as some words were written on the board for use in class activities. It is reasonable to assume that Michelle reached towards more effective use of environmental resources by a progression through a series of cognitive processes which built on previous experience and knowledge gained in other contexts.

All of the strategies Michelle used have been identified in studies of students in regular classrooms by Cambourne & Turbill (1987), Graves

Finally, intertextuality as a meaning making strategy was evident in links with other representational systems, links with other texts and links with life experiences. Michelle transferred knowledge or experience from another context (life experience, text, drawing or illustration) on to the computer in the form of text or in some cases her text evoked links with other contexts which resulted in the production of new text. Intertextuality in the meaning of the word which is adopted here (i.e transfer of knowledge/experience from one context to another as in composing a text, drawing on life experience for her subject or in relating a text to the context of life experience or transferring from text in another context) was pervasive. She drew extensively on events she had experienced and her drawings and texts in her language book to form her texts and as time went on she made connections between her texts and related concepts in other contexts.

As Michelle gained confidence in her ability to write it was apparent that her use of strategies to support her literacy provided a framework or scaffolding which enabled her to achieve much more than she would have done otherwise. The fact that she was encouraged to be independent whilst she was aware that assistance was available if required stimulated her to greater effort, and I believe, helped her to reach towards her full potential. As an active learner, she worked towards the concepts she needed to support her literacy learning through her own participation in the learning experience. There were periods when she reverted to copying and avoiding risks but this is noted in other studies with children in regular classrooms.
It seemed from the data that Michelle was capable of greater individual effort in literacy learning than her performance on standardised tests indicated. As Vygotsky noted, a child's ability is more clearly defined by what he/she is capable of with assistance than by what can be achieved alone. The first defines developmental potential, the second defines actual developmental level. Michelle demonstrated that she could achieve more with the help and support that she needed than she could alone. Vygotsky's Zone of Proximal Development proposes that actual potential for achievement is higher than a child can achieve alone.

"The actual developmental level characterises mental development retrospectively, while the zone of proximal development characterises mental development prospectively." What a child can do with assistance one day, they can do alone the next day. (Vygotsky 1978, pp86-87)

Increasingly Michelle took control of her writing. She moved from the initial stage when she needed prompting by questions about what she would write about or what she had been doing to stimulate ideas, to gradually becoming decisive about what she would write. Eventually taking control herself by reversing the roles as she directed me to type her text.

Lucy McCormick Calkins says "When children write, they reach for the skills they need...When children ask the questions and raise the dilemmas, skills are learned in context." (in R.D. Walshe (Ed), 1981, p89). Michelle did reach for the skills she needed, when she needed them.

Michelle clearly demonstrated that what she could achieve with assistance was ahead of what she could achieve alone. When a child's mental age is determined using tests, it is almost always the actual developmental level
which is tested, therefore it represents a summary of completed development. If education is oriented to that developmental level then it is oriented "toward yesterday's development, toward developmental stages already completed" (Vygotsky, 1978, p 89). This has profound implications for special education. Previous studies have indicated that children with intellectual disabilities are not very capable of abstract thinking, therefore special schools have in the past tended to adopt the principle of teaching these children using 'concrete, look-and-do methods'. This study indicates that with encouragement children in the mildly/moderate range of intellectual disability are capable of abstract thinking.

To promote the current concept that every child should be educated to the limit of his/her capabilities educators need to consider the possibility that encouraging independent learning increases the child's inclination to independent learning and directing learning stifles autonomy. (Vygotsky, 1978,p 89)
CASE STUDY 2

Mark

Background Information

Mark was five years old and the youngest member of the integration class when this project began in July 1985. Special placement had not been recommended for Mark in 1985. The application for placement was initiated by his parents who were concerned that he would have difficulties in a general primary class. They had been told he had a tendency to autism. He exhibited a general reluctance to communicate and had difficulty socialising with other children. They thought he would be better placed in a special class where his lack of communication skills would receive more attention and that in a smaller group he might respond more readily to class instruction. His performance on a standardised diagnostic instrument WISC-R indicated that he was functioning in the mild/moderate range of intellectual handicap (part of school records).

The class teacher reported that he did have a communication problem and he attended speech therapy classes. The teacher indicated that it may have been a behavioural rather than a developmental problem.

Mark generally worked quietly by himself not communicating very much, but participated in the usual class activities, practice writing, colouring in, copying numbers. The integration class joined the host school infants class for language activities. It was during this time that Mark first made a social
contact which he initiated. He showed me his 'story' (drawing) in his language workbook, he said it was "Cissie" (his sister).

The data which was used to construct Mark's case study was collected from July 1985 to December 1987. It came from a total of fifty sessions of 20-30 minutes during which time I observed Mark and conversed with him as he composed text using a computer as a writing tool.

He showed interest in the computer from the first and was always eager to take his turn at the keyboard.

Theme 1 Literacy Development

Phase 1, 16 July, to 29 October, 1985.

Over this period of time I observed Mark for thirteen sessions, during these sessions he composed ten texts ranging from three to ten words. One text was made up of related sentences but the typing was only partially completed. These texts ranged over the following topics; his name and address, names of friends, his birthday, play at the beach, in the garden, play lunch, information about his sister.

In the first two sessions I observed Mark, the computer was not used. He showed me his drawing and made attempts to write on paper. I also observed as he wrote letters and numbers in his class book, copying from samples.
His first attempts on the computer were not recorded as he deleted everything before it could be saved. This happened in sessions 3, 4 and 5. After this he understood that his work could be saved and the records for sessions 6 to 13 were retained.

I asked "What would you like to write about today?" to get him started in the first few sessions. By October he was taking the initiative and deciding his topics or choosing texts to copy.

During this phase he mainly relied on copying his text either from my written version of his orally composed text, or from his workbook or books. The data collected from these literacy events showed that Mark had the following literacy related knowledge and skills at this stage in the project.

i) Knowledge that:
* spoken language can be represented by marks on paper in both written and pictorial form.

* written language proceeds from left to right. (In session 2(17.7.85) he wrote his name proceeding from left to right.)

* written language was made up of various units ('words' 'letters'). (In session 7(24.9.85) Mark showed he knew the two words were discrete when he deleted text to insert a missed space between them.)

* letters had specific names, sounds and shapes associated with them

* letter shapes had two forms (capitals and small) some of which were very similar (c,s,o) and some which were very different (a,g,h). He demonstrated his awareness of difference in session 17(10.3.86) when he typed upper and lower case A's when copying the date from the board. He then pointed out the difference in the small a on the keyboard and the form written on the board. He did not query the difference between the upper and lower case letters.
there were specific cases where capitals should be used (names, beginning of sentences) for example session 2(17.7.85),(24.9.85). In session 2 he approximated his name and surname using my pen and notepad, and used a capital to start each name. When I asked him what it said, he told me "Mark F........, his full name. In session 7 he asked "How to get big" and used the shift key to change to upper case to start his text. In the second text he changed to upper case after he realised his error with i but did not correct and produced 'i SAW the red ladybug in the garden'.

*his own life experiences could be recounted in both oral and written language

(ii) Skill in:

*recognising all letters of the alphabet by name and associated sound in both capital and small forms. (This was demonstrated in session 4(30.7.85) when he typed all the letters of the alphabet, in order and pronounced each letter name as he typed. He asked for help to locate V, W and Y but he knew the letters as he asked "Where's V.....W.....Y?"

*orally composing a coherent text about his own experiences.

*accurately copying text from written form to the computer keyboard.

By the end of July he had his first name under control.
Cameo 1

In session 4(30.7.85) he started to type the first letters of his name, stopped, took a pen and wrote MARK on paper then completed correctly on the computer. It seemed that at this stage he was making a transition from pen-paper to keyboard. His action highlighted the change that was occurring as he later realised that he could dispense with the intermediate step and type directly on the keyboard. He then progressed to typing directly on the keyboard. In session 5 (13.8.85) he typed his own name and those of classmates directly on the computer. He asked one of the girls for help to spell her name but the other he had correct. In session 11(21.10.85) he approximated his full name, by the end of October he could type his full name correctly.

Mark made his first attempt to type a text independently in session 9(8.10.85) when he typed 'IG T' (placeholding for I GO TO using the sound as he said the words to pick the starting letter)

By October, this repertoire of behaviours was added to in the following ways: Firstly, he used the return key to format text. This behaviour was also observed in sessions 8(1.10.85) 10(15.10.85), 13(29.10.85 in this phase and in sessions 15(25.2.86),16(3.3.86), 17(10.3.86), 18 (18.3.86), 20(7.4.86),21(15.4.86) 22(28.4.86, 23(29.4.896) in Phase 2 and subsequently in many other sessions throughout the project. (In using the return key, he was making use of computing skills but the purpose was to order his text, therefore he was using the computer to serve the needs of his literacy development.)
Secondly, rather than simply copying from the sources he had used previously, Mark made his first attempts to type directly on the computer. He asked for help with spelling days of the week by asking "Is that next?" as he typed the letter he thought it should be.

Thirdly, he demonstrated that he was using internalised knowledge in constructing texts. Mark knew that the date he copied from my notes session 10 (15.10.85) represented the day and added the name of the day on the same line. In this instance he was using the temporary environment (my notes) but adding his own knowledge to establish that the day was Tuesday.

Mark demonstrated that he knew that meaning could be represented by different symbol systems.

Cameo 2
Mark copied the nursery rhyme Baa Baa Blacksheep from a book, pronouncing the words as he typed. When he typed 'THREE BAGS FULL' he pointed to the numeral 3 and said 'That's three' and typed underneath '3 BAGS FULL'. He did not delete the copied text but retained both versions.

<table>
<thead>
<tr>
<th>THREE E</th>
<th>BAGS</th>
<th>FULL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 BAGS FULL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I believe this indicated his awareness of the two systems and that he was in process of discovering they could both be used to convey the same meaning.
Another instance which showed that Mark knew that meaning could be represented by different symbol systems, occurred in session 13(29.10.85) when he explained his drawing and related it to the text which he then copied onto the computer. This indicated that he was aware that meaning represented by one symbol system could subsequently be re-interpreted in another mode. It is reasonable to assume from this and his earlier oral labelling of "Cissie" in session 1(16.7.85) that he was able to attach meaning to pictorial symbols. His subsequent copying of the text 'This is us swimming' after it was read out showed he linked the text to the drawing and that he knew exactly what the pictorial symbols represented. This demonstrated that he knew that he could transfer the meaning to another symbol system by transferring to a printed representation through the computer.

During this phase I observed Mark's first independent attempt to write a complete sentence on the computer, session 11(21.10.85). He did not use capitals in this instance, possibly this was an indication that he was concentrating more on constructing meaning than on conventions of print. This appeared to be linked to the apparent regression behaviour noted by Graves and others in relation to children's writing. Mark abandoned his usual habit of using capitals as he attempted to construct meaning and type independently. This behaviour was also observed in sessions 12(22.10.85) and 13(29.10.85) and again in sessions 17(10.3.86), and 18(18.3.86) in Phase 2.

Mark also began to exhibit some awareness of punctuation after asking where the stop was in session 9(8.10.85) when he typed the date. He
continued to use the stop in the date and subsequently put a stop at the end of his text session 13(29.10.85).

It was also during this phase that evidence appeared that he knew his text could be read back from the screen.

**Cameo 3**

In session 6(23.9.85) he read back his orally composed text 'Happy birthday Mark' as 'Happy birthday to me'. It seemed that although he 'misread' by interpreting Mark in a personal way to himself he knew that the text represented the meaning he had constructed and could be retrieved. What is equally important here is that this event illuminated Mark's conception of text. He recognised his name and knew it referred to him, he expressed it in relation to himself not as it was printed. This displayed a 'primitive' stage of symbol development. He did not read 'MARK' as a direct symbol but as a second order symbol designating himself. Mark did not detach the word 'MARK' from himself (the object). Later in session 8(1.10.85), Mark referred to himself objectively when he composed a text 'mark is going to play lunch' rather than "I am..". Perhaps he had then reached a transition stage where he could distance himself from the text and detach the word from the object.

He had not at that stage started to perceive written language in the same way as spoken language (Vygotsky, 1978, p116). To clarify this point, Vygotsky, stated, in considering the syntax of word meanings:

The child must learn to distinguish between semantics and phonetics and understand the nature of the difference. At first he uses verbal forms and meanings without being conscious of them as separate. The word, to the child is an integral part of the object it denotes. Such a conception seems to be characteristic of primitive linguistic consciousness. (Vygotsky 1962, p 128)
Luria (1976) termed this stage of operations 'graphic-functional' in his study of illiterate peasants. He found that their thinking was related directly to immediate and known items or practices, 'the physical features of objects in practical circumstances' they could not theorise about unknown or distant situations. Luria compared other groups of peasants who had undergone some education and found that it was not until some form of education had been experienced that a change to more mediated thinking occurred.

**Phase 2, 18 February to 24 June 1986**

During this phase I observed Mark twelve times for sessions of fifteen to twenty-five minutes. During these sessions he composed thirteen texts and typed his name, address and friends' names a number of times as well as days of the week and weather words. The texts were single sentences and ranged from three to eight words. These texts ranged over the following topics: swimming, snake, schoolbag, weather, his sister, hot cross bun, fireworks.

This phase was characterised by an extension of his vocabulary of sight words, these included: I IS IT US GO A IN THE BE SEA CAT MY AT HOT WINDY SWIM. There was also a marked increase in his use of the environment to support his texts and to provide sources of text. I observed the following literacy related behaviours:

* Mark typed a sentence then changed the word 'SWIM' to 'SWIMMING' in session 14 (18.2.86), demonstrating that he knew that words could change their meaning with different endings. When asked what he had been doing, his response had been "Went swimming" then when he typed his text he
changed this to 'I go for a swim'. He typed 'I go' from memory, pronounced FOR slowly and emphasised the last letter sound. He asked if each letter was right as he went along, using the sound to identify letters and help his spelling then typed 'a swim' from memory. He then asked for help to change it to "swimming" I supplied the letters as requested. He subsequently deleted this and retyped swimming without assistance.

* Repetition: He used the word 'swimming' repeatedly over three sessions, first copied (29.10.85), then made independent attempts (18.2.86, 25.2.86) but needed help with the ending, each time he improved his attempt. This use of repetition was also apparent in his attempts to gain control of weather words in sessions 17(10.3.86), 21(15.4.86), 24(20.5.86) in this phase and continued into phase 3 in sessions 26(8.7.86), and 27(7.8.86).

*Mark used the return key to segment according to inherent grammatical categories.

Cameo 4

In sessions 15(25.2.86) and 16(3.3.86) he typed:

(i) SNAKE (subject)
SWIMMING (action)
IN THE SEA (location)

(ii) I HAVE (subject-verb)
MY BARG (object)
AT SCHOOL (location)

This seemed to be a way of separating the parts of his text into the different components of the sentence as indicated in parentheses. He had earlier, in session 10(15.10.85) used the return key to format his text in the same way as
in the book he copied, and again in the first text of the session being discussed when he copied from his workbook. However the segmenting noted here was not a copied format. There is a pattern which warrants further consideration in terms of linguistic development. What was his purpose? his audience? (I think at this stage in his operations I was his main audience, then his teacher, eventually he liked to print and take his work home to show the family.) At this stage let us suppose he was writing to show me what he knew or could do. In text (i) he decided on a subject, he picked a word SNAKE, that was his starting point, that was what he was going to write about. Then he thought about what he could tell me about snakes, this was a different topic so he went to the next line, he then needed to tell me where the snake was, so again a different aspect and a new line.

In text (ii) I was definitely his audience as he actually brought his bag to show me before typing the text. He was giving me information about himself. He was firstly telling me something about himself (subject) and his status (verb). The next part concerned the object, (a separate component), what would he tell me about? The third part again was location. I believe that Mark was emulating the 'down the page' organisation of poems/rhymes he had seen in books but that he also organised it into what he recognised as natural divisions, i.e. inherent grammatical categories.

I did not observe such a clear separation into grammatical categories again until a similar behaviour was observed in session 29(10.10.86) when he typed:

MARK IS SEVEN YEARS OLD (subject-verb-description)

ON
22ND SEPTEMBER (temporal link)

1986. (For the first text he referred to charts for spelling and format.)

(Here he used return to leave a space between texts)

BOAT (subject) (He told me he saw a boat but did not type the verb)

at figtee (location) / (he originally separated here but deleted and continued on the same line) WE WENT subject - verb of second part of text)

TO

BOWLING AT (extension of verb)

TEN PIN (location)

A possible explanation is that Mark could be using his intuitive sense of grammar (Chomskian "competence") to segment his discourse as a primitive way of formatting text.

Another possibility is the effect of the peripheral text, his second text appeared to be an attempt to follow the format above.

**Cameo 5**

In session 16(3.3.86) I also noted the first appearance of temporary spelling 'BARG', he pronounced the words slowly as he typed and asked for assistance with letters for HAVE and SCHOOL when unsure but for BARG he decided what the letters were.

He typed a complete sentence using temporary spelling in session 24(20.5.86), he told me he had new shoes and showed them to me. He then pronounced the words slowly as he typed, 'I HAVE GOT NEW SHOE' he said "NEW and SHOE" over several times exaggerating the phonemes as he tried to spell from the way it sounded but he did not ask for help. He produced 'I HAV GT NYW SIU'.

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The strategy he used appeared to be coincident with that identified by Bouffler (1984), Harste, Woodward & Burke (1984, p 96), and Cambourne & Turbill (1987, p25), i.e spelling the way it sounds using both a direct sound/symbol relationship and a phonemic emphasis. This supports my contention that these students use the same supporting structures in their literacy learning that students in regular classrooms have been observed to use. The use of this strategy was also noted in sessions 17, 18, 20, 21, 23, 25 in this phase and subsequently on many occasions later in the project.

*He was aware that he could correct errors, for example session 17(10.3.86) as he copied the date from the board, he typed n instead of r in March, he realised his mistake and typed r but did not delete the n and left the text as 'monday 10manrch 1986'. Implicit in his correction is the fact that he was aware that there was a conventional form and of the need to comply with it.

*Mark used his workbook consistently as a source of text in the early stages of this phase, in sessions 15(25.2.86), 17(10.3.86), 18(18.3.86), 19(24.3.86) 21(15.4.86). He also used books, charts, the computer, the board and any other source of text he could find.

It was during this phase that I observed evidence of Mark' increasing skill in reading. For example session 17(10.3.86) he asked for assistance as he read from his workbook:

"Hi Diddle Diddle
The cat and the fiddle
The cow jumped over the moon
The little dog laughed
To see such fun
And the dish ran away with the spoon".

He knew some of the words but needed help with 'jumped, over, laughed, away, spoon' (possibly this was partly from memory of the rhyme but he identified it with the text). In session 19 (24.3.86) he read some of the words from his workbook as he partly copied and partly typed from memory the text 'I WOULD BETHE HIGH BIVER (I WOULD BE THE HIGH DIVER) I WOULD JUMPDOWN INTO THE WATER. He needed assistance with unfamiliar words 'WOULD, HIGH, JUMP, WATER. In session 22 (28.4.86) he had copied a program instruction from the menu at the top of the screen 'TYPPE IN TEXT'. He asked "What does that say?" but he read it with me, forming the words as he identified the letter sounds as I pointed to them. (He had an extra p in type). Later in the project for example during phase 3, in session 26(8.7.86) he read back his text 'RUNNING IN THE SUN AND RAIN from the screen, reading with me as I pointed to the words on screen but with Mark making the decision as I prompted 'RU' to start him. In session 30(14.11.86) he read his text from the screen 'APL FUR DONNA' (Apple for Donna) when I asked him what it said. (He had typed it directly on the computer without oral rehearsal).

By the end of Phase 2 Mark was using all of the strategies identified by Cambourne and Turbill (1987). He asked for help, copied from text, used a number of sources in the environment, made repeated attempts to spell words, and used the sound of words, emphasising syllabic units to aid in his construction of text. This last behaviour has been identified as phonemic segmentation by Cambourne & Turbill (1987). Mark also showed evidence of placeholdering in Phase 1 but he progressed quickly to approximating using the strategy of phonemic segmentation.
Phase 3, 8 July, to 14 November, 1986

During this phase I observed Mark five times for periods ranging from twenty to twenty-five minutes. During these sessions he composed eight texts ranging from three to nine words, and one to two sentences.

These texts ranged over the following topics: the date, pets, weather related activities, personal information, rabbits, excursions, his sister. Some of his texts were derived from class experience, some from life experience and also from direct observation of events.

For example in session 27(7.8.86) Mark commented that it was a rainy day and typed a text 'IN THE RAIN I GOT WET', the only external aid he used was to check the spelling of 'rain' on a chart. This event highlighted the literacy knowledge and skills that Mark had developed:

(i) Knowledge that:

* observation of events could provide ideas for text
* his own experience could be written and recorded
* he could compose text from sight words
* he could use the sound of words to help his spelling
* he could find help in the environment for words he was uncertain of.
(ii) Skill in:

* composing coherent text from life experience
* using direct observation as a source of ideas
* linking life experience to text (Intertextuality)
* thinking abstractly as he linked his observation of the rainy day to his experience of what happened when he went out in the rain
* recognising print in the environment to support his text.

During this phase Mark continued to use the phonemic segmentation strategy observed earlier to help his spelling. He carried themes through from previous work, and continued to improve his knowledge and control of the conventions of the date. He extended his use of the environment to aid construction of his texts and showed his ability to use abstract thought as he linked prior knowledge of topics to the new context of his texts.

*Mark was using the shift key, return and spacing confidently by this time.

The development of computing skills will be dealt with in another section.

**Phase 4, 3 March, to 4 June, 1987**

During this phase I observed Mark on nine occasions from periods ranging from twenty to thirty minutes. During these sessions Mark composed fourteen texts ranging from four to twenty four words and one to four sentences/components. These texts ranged over the following topics:

School lessons, school friends behaviours, beginning letters of words, a recount of his stay away from home, his breakfast, school dance, family events, comments on weather, nests and trees, description of night time.
This phase was characterised by an alternation of playing safe by typing words and names he knew or copying from existing texts and risk taking with temporary spelling, sometimes all in the same session. His texts increased in length and complexity for example in sessions 37(21.5.87), 38(28.5.87) he typed from life experience. He did not use punctuation but three to four component sentences could be identified in each. For example in session 38 one of his texts was the dance day:

**Cameo 6**

'WE HETA DEUS DAY AT SCHOOL ET WAS VRWEGOOD TAM WE ALLAT FEN AND ATSCHOOL (Here he asked me to type DANCE DAY then deleted it and replaced it with AT SCHOOL)

MSS D...... WAS HAPPY (This was separated from the rest of the text by use of the return key.)

Mark read this to his teacher "We had a Dance Day at school It was very good time We all had fun at school Mrs D...... was happy".

This event served to highlight the interactive and interdependent way in which Mark was using reading and writing. His attempts to make meaning were also helping him to construct meaning. It was a two-way process, he was progressing in both writing and reading. It was also evident that the visibility of the text on the screen encouraged interaction with the teacher, and others. He extended his audience as his confidence in his ability to express meaning grew, inviting the teacher and others to look at his work.
*Mark took the initiative in deciding his topics, for example in sessions 38(28.5.87), 39(4.6.87) he commenced to type his text and explained what he had written after he finished typing.

*It was during this phase too that I observed that Mark began to type directly on the computer without first rehearsing his intended text orally. This behaviour developed over time and seemed to be linked to his later habit of entering into dialogue on screen. This was first observed in session 33(2.4.87) when he typed names of class members and in response to my scaffolding "What are you going to write about them?" he approximated as follows:

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**Cameo 7**

'HEVE BEUN CELLD TODAY' he prompted me by telling me the words as I read from the screen "Have been good today." In session 39(4.6.87) he typed his text 'MEALIE AND MARK WS CAERN' again without rehearsing orally, and then told me 'That says Melanie and Mark was crying'.

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Mark was reporting his news directly through the computer, using it for communication. He had adopted the use of the computer as a writing tool and as a means of direct communication. This was an important development in terms of his expansion of means of interacting with others. The computer provided a non-threatening social link between student and teacher/peers /others.

The following literacy related behaviours were also observed:

* By March he could type the date independently in either long or short form. He had progressed from copying from my notes; to using the board to help spelling; to typing without external support. For example in session
32(19.3.87) he typed the date, then the day underneath. He then made the link between the day and classes held on that day. He had the concept of day and date well under control.

*It was during this phase that Mark started to ask the teacher to come over so that he could read his text to her. A clear indication that he was pleased with his achievement, and wanted to display his prowess in writing and his reading competence to a wider audience, his teacher.

* Mark's reading progress was very marked, this was evidenced not only by what he could actually read, but also by the processes (strategies) he had internalised during this progression. Earlier in the project he had identified single, familiar words and names on the screen as he moved to the end of the file. By this stage he could read for meaning from the screen as he moved to the end of the file to start new work. For example in session 34(30.4.87) he read back complete sentences from previous texts, which had been completed weeks earlier. He also read his texts from the screen for the teacher in sessions 37(21.5.87), and 38(28.5.87) in this phase and continued to do so in Phase 5. As a further example, 34(30.4.87) Mark had typed a text about his friends and needed the word 'play' to finish his sentence. He pronounced the word slowly a few times, trying to identify the letter sounds but did not attempt to spell it from sound. He looked for a book to help him, he looked through several books but could not find the word he was looking for (I checked, and it was not in the books). He kept looking without success and finally I indicated a chart about Play School and asked if he had seen the new chart (without any sign that it might help). As soon as he saw the word 'Play' he recognised it (clearly a visual cue), and completed his sentence with help from the chart. He also read from books for example session 31(3.3.87) and demonstrated that he could read from charts and other
environmental print. This was clearly illustrated in session 36(14.5.87) when he copied 'MOVE 830' from the menu at the top of the screen and read it out as "Movie eight thirty".

* Mark's vocabulary of sight words had grown, by this time he could spell from memory words such as NAME, TODAY, SCHOOL, CAME, GOOD, HE COULD TYPE THE NAMES OF HIS SCHOOL FRIENDS AND DAYS OF THE WEEK (he sometimes checked the days, but usually after typing them). He approximated unfamiliar words from sound using phonemic segmentation but he also attempted familiar words without pronouncing them. He was obviously using visual memory cues as noted in session 33(2.4.87).

* He demonstrated increasing independence in his literacy learning. On a number of occasions he avoided composing by typing friend's names. I prompted him on these occasions by asking "What are you going to write about them?" providing scaffolding, and he would add some comment. At other times he decided on a topic and commenced to type independently. For example in session 36(14.5.87) after he had typed his friends' names, he took my pen and wrote on my notes 'CAME TO SCHOOL' then typed this and added 'WEHF ME' (an approximation of WITH) without further external reference. Later in phase 4, in session 46(10.9.87) he added 'GOOD AT SCHOOL TODAY' (after I provided scaffolding) all of these words were sight known words. In the next session 47(29.10.87) he typed 'EMMA AND MELISSA TALKEN BAT BOOKS' without any external assistance, he used phonemic segmentation to help his spelling. He was making an observation of Emma and Melissa's activity at the time "Talking about books". It can be seen from the above that he was using a variety of strategies, he did not rely on any one more than others but used whatever he needed at the time and sometimes more than one strategy in a single event.
*In the later stages of this phase Mark started to expand his texts and adopted a reporting type style. His use of temporary spelling increased as he attempted to express himself. This was observed in this Phase in sessions 37(21.5.87), 38(28.5.87) and later in Phase 5, sessions 40(2.7.87), 41(23.7.87), 43 (13.8.87). In session 37(21.5.87), he started to write his text on paper then decided to type it on the computer. It seemed he preferred to type directly on the computer. His sentence structure was imperfect but he made a good attempt to recount events.

Cameo 8

WE WEAT TO MRS BRO... AT4 DAY TO SLEEP
WE WR HAPPY
MRS DO...... WSAT HEME WE WET TOSEE AT MRS DO....... 
In session 43(13.8.87) He typed another text about a visit to Mrs Bro...
I WAT TO MRS BRO... 4 NEATS I GO HEME ON FRIDAY I HET SEME BREKFASTS

His first text read:

We went to Mrs Bro----'s AT 4(for four) days to sleep
We were happy
Mrs Do------ was at home we went to see (her) at Mrs Do------.
It seemed that he was using return to provide a break in the text instead of a stop.

He was innovative in the use of the word 'AT', he avoided using 'for four' by typing AT4, choosing another word and using the numeral instead of the word four. This is similar behaviour to that Harste, Woodward and Burke (1984 p99), identified as "Knowing one doesn't know", they say "realizing one doesn't know is a significant step in knowing". A possible explanation of this strategy is that he didn't know if it was correct to write two words that sounded the same together therefore he used another word and the numeric symbol to avoid the problem. In the second text (see previous page) he eliminated the problem by simply using the numeral 4. I do not recall ever hearing Mark use a structure like "for-four" and there is no evidence of it in my notes. He also used AT to make it clear that he went to see Mrs DO...... AT her home. This is yet another example of the way that Mark utilised the same strategies that other researchers have observed in studies of young (non-disabled) children learning to write.

**Phase 5, 2 July to 11 December, 1987.**

During this phase I observed Mark eleven times for periods ranging from fifteen to twenty five minutes. During these sessions he composed nineteen texts ranging from five to seventeen words and one to three sentences.

These texts ranged over the following topics:
Mrs Bro----'s home, holiday with teacher, his sister's birthday, a fishing day, activities on sunny days, an excursion, visit to Mrs Bro----, winter weather,
Mark's fish, daddy at work, date, fish swimming, friends activities, coming to school, panda in the zoo, visit to MacDonalds.

Mark continued to use the skills and knowledge he had already displayed in his construction of text. I also observed a new behaviour when he established ownership of his text in session 43(13.8.87). Again there were periods when he would avoid composing and use known words or copy from print and others when he approximated freely. He attempted quite long and difficult words at this stage for example 'HAETDAY' for holiday, 'PEASSAEN' for present, "CAEEAAS" for catch, TALKEN' for talking, 'BREK FASTS' for breakfast, 'WATAR' for water, 'HANAMBRGR' for hamburger (sessions 40, 41, 43, 46, 47, 50)

During this phase I observed the following literacy related behaviours:
*Mark clearly used the computer for dialogue. For example, session 41(23.7.87) he typed 'MELIANIES BIRTHDAY ON FRIDAY', and responded on the computer 'YES SHE HEAF A PEATE' and 'A PEASSAEN' when I asked if she would have a party and presents. This behaviour continued during that session and was also observed in session 46(10.9.87), and 48(19.11.87) when he read back my communication to him 'MARK IS PLAYING' from the computer and again in session 50(11.12.87) in his text about the panda and MacDonalds. His responses were abbreviated as in speech not extended as in writing. For example when I asked what he had to eat at MacDonalds he typed 'HANAMBRGR GEPS TO.' (Hamburger chips too) then 'YES.' DRREING' (drink) when I asked if he had a drink.
He was using the computer as a tool for communication. In so doing he was revealing the depth of knowledge and understanding he had acquired. He showed that he could compose directly on the computer without oral rehearsal. This indicated that he was using abstract thought, he did not need to say the words, he was going straight from the thought to writing. At the same time he demonstrated that he was attending to visual surface structures in reading when he read back my typed message 'Mark is playing' in session 48. He had no contextual clues of what I would type.

These examples also show the range of reading and writing skills Mark had acquired. For example in session 41:

- he read from previous texts as he moved to the end of his file
- in the first part of his text he copied 'birthday' from a wall chart
- he edited by changing FIRDAY to FRIDAY as he typed from memory
- he inserted a missed space and put a stop at the end of the text
- he responded directly on the computer when I asked questions
- he used temporary spelling -approximation
- he checked the spelling of 'sunny' on the board and corrected his approximation of 'senny'.

*Mark began to display more sophisticated editing behaviour. He edited in a way which was more clearly related to correcting text than his previous behaviour of deleting and correcting individual letters identified as errors as he typed. For example in session 41 (23.7.87) he corrected FIRDAY to FRIDAY and inserted a missed space. This was done after he had completed typing his text and noted the misspelled word. Friday was a known by sight word by this stage and he corrected for errors. The following week in session 42 (30.7.87), he made a change to the previous weeks text, editing by adding his name to the text to make it clearer that he had spent the day fishing with Adam. I again observed editing behaviour in session 45 (3.9.87) when he
copied from his own written work (with errors) but noticed the errors when he read the text on the screen and corrected from 'Marks fihs in the warter' to "MARK FISH IN THE WATER", he also corrected SAPTEMBER to SEPTEMBER when he noted the error (September was also in his sight word vocabulary by this stage). He again edited in session 48(19.11.87) when he typed a series of adjustments to WEDNESDAY.

*I noted the first evidence of 'authoring' (taking ownership) of the text in session 43(13.8.87) when he composed his own text about winter after copying a text about Winter from a book. He put his own name at the beginning of his own text to establish ownership.

He copied 'A BOY PUT ON HIS SOCKS SCARF AND GUM BOOTS TO GO OUTSIDE TO THE SNOW'. Then typed his own text beginning with his name "MARK FO----- IT IS COLD IT IS WINTER IT IS RAINING

*I observed a regression to placeholderin session 49(26.11.87) when he was more interested in the Christmas preparations than in writing. His attention was directed elsewhere and he displayed a typical reversion to earlier behaviours. However, there was evidence that this was a temporary departure, Mark had typed 'REASN CAR' ( racing car) to demonstrate for Ricky just prior to coming on the computer himself. This approximation was done spontaneously without reference to any external source.

Theme 2: Cognitive Strategies

There is an unavoidable overlap with the above data in some points in the following discussion, however it is necessary to review the literacy events observed to gain an insight into the strategies Mark used.
As Mark endeavoured to construct meaning in his texts and to decipher meaning from print it became clear that he used a number of cognitive strategies as a framework on which to build his literacy development.

**Phase 1**

Firstly copying, he copied from my printed version of his orally composed text, from his workbook and other environmental sources.

Secondly, he asked for help from peers, researcher and teacher. He knew that help was available and he could formulate appropriate questions to help him solve problems.

Thirdly he used drawing and illustrative cues as a source of text and support for text construction.

During this phase I observed what appeared to be the beginning of the phonemic segmentation strategy identified by Cambourne & Turbill (1987). Mark began pronouncing some words slowly, as he typed his text, emphasising syllabic units and obviously using the sound to help his spelling. I first observed Mark employing this strategy in sessions 8(1.10.85). This behaviour was observed on other occasions during this phase in sessions 9(8.10.85), 11(21.10.85), 12(22.10.85) and in sessions 16(3.3.86), 20(7.4.86), 23(29.4.86), 24(20.5.86), 25(24.6.86) in phase 2 and was a feature of his behaviour for the remainder of the time he participated in the project.

Mark continued to use copying as a strategy to support his texts but it was no longer his only method of recording his meaning. Towards the end of his
participation he copied as a source of text: words in the environment, instructions in books, labels on boxes. This appeared to be an alternative to composing his own text, avoiding the effort of providing his own ideas.

He also used placeholding with initial letters (session 9) 'IG' for I GO, but he quickly moved on to temporary spelling which was related to the sound of the word as noted above.

By the beginning of October there was evidence that he was using print in the environment. For example in session 8(1.10.85) he checked on a chart to complete the ending of days of the week after he attempted the beginning letters himself. This use of already existing models of text spread to other sources in the environment and included books, charts, illustrations, my notes, the computer screen and his language workbook.

Later, he also used the board, labels, word/show cards, instruction menu from the computer program, disk box, in fact anything at all that he encountered that had print on it.

It was during this phase that I first observed that Mark linked a drawing in his workbook to the written text, pointing to the text as he told me what it said. He copied the text onto the computer demonstrating that he knew he could transfer the meaning of the illustration (his drawing) and the written text to the printed text on the computer. This was one instance of intertextuality, linking drawing to written text and to printed text, as he transferred the meaning to another context (session 13(29.10.85).
Intertextuality (life to text) was also apparent in session 10(15.10.85) when he copied the nursery rhyme Baa Baa Blacksheep and used internalised knowledge from another context in his transfer of the meaning of the numeral 3 and the word three when he typed both versions.

'THREE BAGS FULL
3 BAGS FULL'

Phase 2

Mark continued to use and to refine the strategies he had begun to display during Phase 1. His use of the environment progressed from copying required words to complete a text in process to using print in the environment as a source of ideas for text. For example session 17(10.3.86), 25(24.6.86) and in session 22(28.4.86) when he copied from the program instruction menu at the top of the computer screen as a source of text. He also used his language workbook, the board, charts, and posters in support of his text construction and intertextuality in scrounging ideas from previous lessons as a source of text during this phase.
Phase 3

Mark's progress continued during this Phase, he used phonemic segmentation, temporary spelling, environmental print, copying, asking for help, and intertextuality.

Instances of intertextuality in different forms were observed.

* The use of another form of intertextuality (text to life) was observed in session 28(11.9.86), when Mark typed words from the board and was able to relate knowledge from another context, (his own knowledge about rabbits) to extend the text around the topic. This was an indication that he was accessing his knowledge as a result of linking with the text on the board. The word rabbit obviously triggered connections with other knowledge. In the same text, intertextuality(life to text), was again highlighted when he linked his own knowledge from life experience to writing a text about rabbits. At first he responded "Has fur" and typed 'RABBIT HAS FUR' when asked what he knew about rabbits. He returned to the topic and composed a new text 'THE RABBIT IS FURRY and HAS LONG IES (ears). He transferred his knowledge from another context to his text and expanded the text when he thought further about the subject.

This form of intertextuality appeared again in Phase 4, session 36(14.5.87 as he linked his life experience to his text.

He copied from the Program Menu at the top of the screen:
'MOVE' - this was one of the commands (MOVE TEXT) and then the number '830', this was related to the program.

Mark read it from the computer screen as "Movie eight thirty".
It seemed that he linked the words of his text to advertisements for movies he had probably seen and heard on television.

*The use of abstract thought was evident in Mark's use of prior knowledge in his text about rabbits (above). It was innate in his linking of the text on the computer MOVE 830 to his life experience of "Movie eight thirty" as he read it to represent a familiar phrase because of the word similarity.

* Use of phonemic segmentation was observed in session 28(11.9.86) when Mark pronounced "EARS", emphasising the phonemes and typed 'IES', this strategy was also observed in sessions 26(8.7.86), 29(10.10.86) and 30(14.11.86).

* Use of print in the environment was observed in all sessions during this phase. He had used all the sources mentioned previously on many occasions but in session 28(11.9.86) he used his own typing on the screen as a text support for the first time when he copied 'RABBIT and FUR' from the screen to help construct his expanded text 'THE RABBIT IS FURRY AND HAS LONG IES'.

* Mark was becoming more independent in his use of temporary spelling and some words he would attempt without the use of sound, spelling from how he thought it should look or from visual memory. For example 'apl Fur Donna' was typed directly onto the computer without phonemic assistance.
Phase 4

Use of his established strategies continued during this phase.

- Use of print in the environment was extensive
- Use of phonemic segmentation was still evident
- He also began to approximate spelling without pronouncing words, using visual memory.

* Mark linked topics from previous lessons with print and illustrative cues in the environment and used a third form of intertextuality (text to text) to support his construction of text. For example in session 38(28.5.87) he copied words beginning with Y from the board, then pointed out all the things around the room that were yellow. He pointed out yellow leaves on a poster and typed 'YELLOW LAS'. In session 39(4.6.87) he copied from a poster 'CAN YOU SEE THE AUTUNM (corrected to MN) COLOURS' but read it out as "Can you see the Autumn leaves?" It is significant that Mark made a semantically appropriate substitution here. He linked the text to the illustration of leaves and a previous lesson on Autumn leaves but did not use the visual cue of the beginning letter. I recall pointing out the beginning letters and asking him what it said, he then said "Colours" with prompting.

*It was during this phase that Mark added another strategy to his repertoire. I called it 'on screen dialogue'. I first observed that he was communicating directly through the computer when he used the screen to respond to questions, for example sessions 33(2.4.87), 39(4.6.87) during this phase but it was even more obvious in phase 5. For example in session 41(23.7.87), he typed a text 'Melanies birthday on Friday' and responded directly on the computer "Yes she have a party" and "A present" when I asked if she was
having a party. This behaviour was also observed in sessions 46(10.9.87), 47(29.10.87), 48(19.11.87), and 50(11.12.87).

Phase 5
All of the previously described strategies continued to be used with the exception of the short-lived placeholding. Intertextuality continued to be a feature of text construction.

*Intertextuality (life to text) was clearly evident in Mark's text 'PANTA IN THE ZOO RED'. The illustrative cue of a panda on a poster triggered the text and he typed 'PANTA'. When I said "Panda's live in China" he rejected this, he knew from his own experience that Panda's live 'IN THE ZOO' and he typed that on the computer. He also insisted that they were 'RED'. (I later came across an illustration in a book they used that showed a red panda, so he was also using intertextuality - text to text).

Theme 3: Computer Use

Mark was interested in everything about the computer, how it went together, where the connecting cables fitted, how it was switched on, how to put the disks in the disk drives to get the program started and most of all in actually using the computer. A typical session would start with Mark 'assisting', helping to unpack the computer and leads, and asking "Where does it go?" Even if he was not first on the computer, he liked to help to set it up.

I had not at any stage 'instructed' the students in typing as such or in operating skills. I demonstrated when there were functions they needed to
know how to use and answered any questions. They explored, observed and asked for help with operating procedures as they needed them. The object was to have them use the computer as a tool for writing not to teach them typing or operating skills. They developed the skills that they needed as they needed them. They did this by asking "where's that?", "what does that do?", "how to go to the next line?" and by intervening after watching my operations with for example "I can do that". As noted previously, Mark explored the keys at first, watching the screen to see what happened. He found where keys were, what happened when he pressed the delete key and over time discovered the function of the shift, return and other keys by observation and by asking for help.

He was very interested in the computer, and liked to prolong his sessions as much as possible. Later in the project he stayed working at the computer during breaks if he was in the middle of a text and on one or two occasions preferred to take a turn on the computer to attending optional functions. Mark found the computer fascinating. One of the interesting things I noted during this study was that even though I was using a simple word processing program (no games except the occasional treat of a word manipulation program such as Reader Rabbit and Story Tree) the students interest in using the computer never waned. Occasionally if important events like Christmas parties were being prepared for they might finish earlier to participate but otherwise they all continued to show a high level of commitment to writing on the computer. This deep engagement was confirmed recently when I spoke to his teacher in 1991. She told me he had improved his reading skills because they had a computer program which required that he read the text for meaning in order to complete the program.
Initially Mark explored the keys in great detail, selecting each in turn and watching the screen to see what happened. There was no doubt that he made the connection between the action at the keyboard and what happened on the screen. Mark certainly displayed the behaviour noted by Olsen & Sulzby, (1990) of focusing on the computer functions before turning his attention to composing.

**Phase 1**

During this Phase Mark spent some time trying out the different keys and locating letters on the keyboard. He had little difficulty with the fact that the letters were in upper case except in a few instances where letters were quite different in form to lower case letters (G,H,T) or where keyboard letters were similar to the lower case form. For example he did confuse the upper case I on the keyboard with lower case l and he sometimes mistook R for k.

During this phase I observed the following skills and behaviours related to the use of the computer:

* Mark pressed all the keys, going methodically along the keyboard rows and watched the screen all the time. He repeated letters by holding down the key and completely filled the screen with one letter.

* He discovered what happened when he pressed the delete key and used it to clear his typing for the first few sessions. After this initial period he used delete to correct errors in his texts. For example in session 7(24.9.85) he used the delete key to correct when he missed spaces and to change a capital G to a small g. He used it like an eraser to correct as he typed.

* Mark inserted the disks in the drives after watching as I set up the program. He said "I can do that" and handled the disk carefully as I instructed him not to bend it and to slide it straight into the drive. His comment that he
could do it reflected his confidence in his ability not only in performing the task but also in communicating to me the fact that he was able to do it.

- It demonstrated his engagement in all that was happening at the computer interface
- that he had attended to my actions
- that he was confident he could perform the task I demonstrated
- he wanted to 'do it himself'
- he demonstrated that he could do it.

After this he continued to insert the disks if it had not been been done before his turn on the computer.

*After I first demonstrated how the space bar was used he remembered and used it appropriately to separate names and words he typed. He also used the space bar to separate text in session 12(22.10.85). There were times when he neglected to space correctly when he was concentrating on other matters.
* He 'read back' his orally composed text in session 6(23.9.85) demonstrating that he knew that what appeared on the screen represented his 'story'.
*Mark used the shift key to change from lower to upper case and back to lower case after asking how to "Get big". This was first observed in sessions 7(24.9.85) and 9(8.10.85).
* Mark typed his name to retrieve his file, this had to be correct for the program to recognise the name. He continued to do this throughout the project and in the later stages he also typed other students names to retrieve their files see sessions 32(19.3.87) in Phase 4 and 48(19.11.87) in Phase 5.
* He asked how to go to "a new line" and used the return key to go to the next line after typing the date in session 8(1.10.85). He again asked how to go to the next line in session 10(15.10.85) and used return to conform to the format of a text he was copying.
* He asked "Where's that?" indicating the stop when copying the date and continued to use the stop in the date after that first occasion observed in session 9(8.10.85). He later began to use the stop intermittently at the end of sentences and after words. For example in session 13(29.10.85) in Phase 1 and sessions 19(24.3.86), 22(28.4.86), 23(29.4.86) 24(20.5.86) and 25(24.6.86) in Phase 2. This erratic use of the stop continued in Phases 3,4 and 5.

During his first session on the computer Mark's exploration of the keyboard was independent and random in that he pressed all the keys but without a specific purpose. He watched the screen to see what happened. For example in session 3(23.7.85) he explored all keys, he pressed the ESC key which switched from the type mode to other menu options. This puzzled him as he could no longer type. I demonstrated how to return to type mode. By September, he was asking how to do things such as "get big" (capitals) as he switched to wanting to use specific functions to produce his texts. He had learned that specific functions were related to specific keys.

His learning curve with relation to the functions of the computer in this phase had been steep.

**Phase 2**

During this Phase Mark's learning curve flattened but he consolidated the learned skills and continued to use them more deliberately for specific purposes. The following behaviours were observed:

*Mark used the delete key to correct errors that he noticed as he typed and to insert missed spaces.
* In Phase 1 Mark had discovered that the cursor could be moved upwards, downwards and sideways as he explored the keys. He had not put this knowledge to use however until I provided scaffolding by pointing out to him that he could move the cursor back over previous typing to correct an error instead of deleting and retyping the whole. He needed the scaffolding to help him to access his knowledge. In session 14(18.2.86) he used the cursor moves to edit. Vygotsky's Zone of Proximal Development was clearly defined as he performed a task, with just a little assistance, which he would not have initiated himself. He had the knowledge and the skill but needed support to use them. Once he had done this, he used the same strategy again in session 15(25.2.86) and 24(20.5.86).

*Mark used the return key to segment his texts internally in sessions 15(25.2.86), 16(3.3.86) and to separate texts 17(10.3.86), 18(18.3.86). He continued to use return to format texts when he copied from books and to format his own texts. He experimented by sectioning texts in different ways for example in session 23(29.4.86) he typed a number of names and used a separate line for each, then used a separate line for each component of his address. In the following session he typed his name and address all on the same line and without any spacing between words.

**Phase 3**

During this Phase Mark was competently using the computing skills he had developed. His typing was accurate when he copied, he could find keys quickly and only occasionally used the wrong letter such as I for l.

*Mark used the shift key whenever he felt the need to change the letters from either case.
* The space bar was used consistently by this stage.

* Mark continued to use return conventionally at times and innovatively at others. For example sessions 28(11.9.86) and 29(10.10.86).

* He edited by using the delete to correct as he went along or the cursor moves to move over typing and then corrected without deleting existing text.

Phase 4

During this Phase Mark added to his repertoire of skills and behaviours in the following ways:

* In session 32(19.3.87). Mark worked through all of the retrieval procedures needed to bring his workfile up on the screen. He started the retrieval from the beginning of the procedure, switching to the selection mode using the ESC key. I gave him some assistance when he was unsure which procedure to select. He had observed on many occasions and knew most of the steps. At the end of his session on the computer Mark went through the retrieval procedures himself, checking to make sure he was right and retrieved Steven's file for him. He used the same procedure to retrieve his own file in the next session without assistance (session 33(2.4.87) and continued to do so in subsequent sessions.

* He continued to use the cursor keys to move to and correct errors, for example session 31(3.3.87). He also began to use the cursor keys to move to the end of his file to start new work. This was observed in sessions 33(2.4.87), 34(30.4.87), 35(7.5.87). He continued this behaviour after this to the end of the project.
*Mark looked for and found the ? when he was typing text but produced / when he pressed the key. He asked why and I explained he must use the shift key to get the symbols on the upper half of the keys. He then typed through all of the symbols to check this. This was observed in session 39(4.6.87), he again checked the symbols in the two following sessions in Phase 5, 40(2.7.87) and 41(23.7.87).

**Phase 5**

During this Phase Mark used the symbol keys to produce dashes and brackets when typing the date in sessions 41(23.7.87) and 47(29.10.87). He was using the knowledge he had recently gained in the previous phase and putting it into practice.

During this phase Mark added the following behaviours to his repertoire of skills:
*He used the cursor key to move up to a previous weeks text to edit it.
*He asked how to move back over letters to make a correction in session 45 (3.9.87). He had been using the cursor keys in this way earlier but started to delete the typing and needed to be shown again how to move over without deleting. This may have been a case of apparent regression (a la Graves et al) as he concentrated on the actual editing but forgot the actual procedure to use. The editing in this case was more complex than his usual type of editing. In session 48(19.11.87) he used the arrow keys to edit without hesitation.
*Mark typed a stop after his name as he tried to retrieve his file, this was not in the identifier name and of course the program would not accept it. Mark
realised what the problem was and knew he had to start the retrieval procedure again. He was accustomed to typing his name to retrieve and knew it had to be correct. On other occasions if a wrong letter had been typed I explained "It must be right or it doesn't work and you have to start again". The next session, he vocalised the letters of his name as he typed to retrieve his file and made sure that he did not make an error again. See sessions 46(10.9.87) and 47(29.10.87). There had been a considerable lapse of time between these sessions but he had retained the memory and avoided repeating the error.

* Mark saved his own file, following the procedures as I showed him the menu sections to select in session 48(19.11.87). He then retrieved Tony's file following the procedures and typed 'Tony' and pressed the return key to effect the retrieval and called him over saying "Tony next" (he had decided who would follow him on the computer).

At the conclusion of his participation in the project Mark could use the computer as a writing tool quite competently. He could switch on after helping to set up, insert the disks to start the program, retrieve files, save files and knew how to switch off. The initiative in mastering these procedures came from Mark when he asked how to complete these operations. His exploration of the keyboard was a learning period but he reinforced that learning by asking how to perform specific functions such as operate the shift key. The function of the shift key was not apparent from pressing the key in his exploration, therefore when he wished to change to upper or lower case he needed to ask what the procedure was. Other functions he discovered, for example the delete key and for others he
observed my actions then asked how to, for example "go to a new line" when he wished to use that function.

Summary

The data shows clearly that Mark was capable of independent learning and that he was stimulated by using the computer. His literacy learning was supported by assistance given when it was needed, and pushed forward by Mark himself as he extended himself to express his texts. His communication skills were enhanced by using the computer. The language activities of the class which were integrated (in what the teacher described as a whole language approach) across the curriculum provided a supportive setting and the computer became a part of that 'whole language' environment. Transfer of experience from class activities to the computer was clearly demonstrated. The links that Mark made between writing and reading, life experience and text, text and text, as he used intertextuality in his writing activities were evident in the data.

Many of his texts were derived from life experience. He also demonstrated that he knew how to scrounge literacy models from all aspects of the environment as he used the different sources in his surroundings. The strategies Mark used were identical to those noted by Cambourne and Turbill (1987), Graves (1983), Calkins (1981, 1983), Harste, Burke and Woodward (1984), Sowers (1981) and others who observe early writing behaviours. Mark made little use of placeholder, he had a good knowledge of sound/letter associations and progressed from copying and using support structures to temporary spelling. He also used the human resources
available to him and showed that with assistance he could achieve more than he would have done alone. Vygotsky's theory of the Zone of Proximal Development could be justified by the evidence in the data. The implications for education here are, this child with the handicap that he apparently had, clearly could do many things that he would not have done without support. He showed many of the learning traits that children in regular classrooms display in their literacy learning. He had the potential for further development, he needed encouragement and motivation. I believe the computer was a vital factor in encouraging Mark in his writing and in his efforts to make his meaning clear.
CASE STUDY 3

Steven

Background Information

Steven joined the class at the beginning of 1987, he was then aged seven. He had first been enrolled in a primary school where his progress had been poor. From there he had gone to a special school for a one year period where he made better progress. He transferred to the integration class I was working with in February 1987. Steven had been recommended for special placement in 1986 after an assessment which indicated an overall slow development, short attention span and below average ability. His performance on standardised diagnostic instruments WPPSI 18.10.85, WISC R 26.5.89, (part of school records) indicated that he was functioning in the mild range of intellectual handicap. His progress during the time he was in this class was good and he transferred to the IO integration class (moderate intellectual disability) in a primary school in 1990.

When I first met Steven his attention span was limited, he had difficulty sitting still and he appeared to be very nervous and 'jumpy'. His speech was not very clear. His letter recognition was poor at first, for example he did not seem to recognise some letter names and sounds without a cue such as A for Apple. He showed evidence that he sometimes reversed E, n, B, and S when writing letters. He could copy letters from print on to the computer (except in cases such as I/l , u/ v, which he confused because of similarity consequently he typed I for l and u for v, he also confused a/p because of the
form he used in writing). This indicated he recognised most letters visually as he related them to the keyboard letters. He knew numbers up to ten.

The data which was used to construct Steven's case study was collected from March 1987 to November 1989. It came from a total of forty one sessions of ten to thirty minutes in which I observed Steven and engaged him in conversation as he composed text using the computer.

In the first few sessions, Steven insisted on deleting parts of his text, (as he said "Rub it out") or moving it out of view. He liked to start with a clear screen, like a new sheet of paper. He pressed the return key continuously to move text up the screen and out of sight or deleted it. He also used the cursor keys to move the cursor to different positions and sometimes deleted the date. This resulted in some confusion where texts were mixed together or deleted. Consequently some of his first efforts were lost.

**Theme 1: Literacy Development**

**Phase 1, 5 March to 4 June, 1987.**

During this period I observed Steven six times for periods ranging from ten to twenty minutes. During these sessions he composed only one text of five words on the topic of 'coming to school'. He did use placeholder at this stage and also attempted to type names.

Because he was not accustomed to the computer at this stage I typed the date and moved down a line ready for him to start. I would say "Good morning
Steven, how are you?" We would exchange some comments about what he would write, what he had been doing, what had happened in class. He did not communicate very well and spoke rather jerkily but he was interested in the computer and keen to try it. He had observed the other students writing on the computer and was anxious to take his turn. During Steven's first use of the computer he pressed the keys in turn and watched the screen then he held keys down and repeated a number of letters. He then said "Take it out" indicating that he wanted me to show him how to remove the text. I showed him the delete key and he deleted all the letters he had typed.

In the early stages of the project Steven concentrated on exploring the computer and finding out what the keys did. He did little composing and relied mainly on copying texts which he selected from various sources in the environment.

Data collected from these literacy events showed that Steven had the following literacy related knowledge and skills at this stage in the project.

(i) Knowledge that:

* spoken language could be represented by marks on paper (writing), and by print on the computer

* written language was made up of various units 'words' 'letters'

* letters had specific names, sounds and shapes associated with them

* his own experiences could be recounted in both oral and written language

* letter shapes had two forms (capitals and small) some of which were very similar (c,s etc) and some which were very different (g,h)

* written language proceeds from left to right (on one occasion he reversed his writing)
(ii) Skill in:

* orally composing a coherent text about his experience

* recognising some letters by name and associated sound in both capital and small forms

* accurately copying text from written form to keyboard but he confused certain letters because of keyboard appearance.

During this phase I observed the following literacy related behaviours:

* He knew the date was a means of recording the day and the month for example in sessions 2(19.3.87), he adjusted the abbreviated date I had typed to his own version of 'thursday 9'. By June 6(4.6.87), he had progressed to copying the date from the board, he did not accept the 6 as a representation of June but typed '4 june 1987'.

* Steven progressed from copying or approximating his name in the first sessions to writing his first name correctly then transferring it to the computer in Phase 2.

* Steven used the beginning letters of familiar names and words to help him identify and find letters on the keyboard. For example in session 4(30.4.87) he was looking for E as he typed his own name, he said "E for Emma" and found the letter, once he was sure what he was looking for. This behaviour was also observed in Phase 2, sessions 18(17.3.88), 19(14.14.88) and in Phase 3 session 28(27.7.88) later in the project.

* Steven composed his first text in session 4(30.4.87) 'Today I came to school'. He first typed letters to placeholder then typed from my spoken letters, he put in the numeral 2 himself in today (his own attempt) and typed 'tio2day'. He made another attempt later and said "Today" slowly twice, separating the
syllables, and retyped twice 'today todAY'. This was his first attempt to put a word together using sound to help. He also used the previous typing to check his spelling so it was a combination of strategies but it did show the beginnings of phonemic segmentation. It was not until May 1988 (Phase 3) that he showed clear evidence that he was using phonemic segmentation. In session 22(12.5.88), he pronounced the word LIKE, emphasising the syllabic units and spelled it as 'likkkee'. By July 1988 he was obviously using sound to aid his spelling for example session 27(27.7.88), Phase 4 he said out various vowel sounds to try to identify which letter came after o in mouse and continued to identify letters by sound to complete his text. His delay in using this strategy could probably be accounted for by his reliance on copying existing texts in the early stages of the project.

Phase 2, 2 July, to 3 December, 1987

During this phase I observed Steven on ten occasions for periods ranging from ten to twenty minutes. During these sessions Steven relied mainly on copying and attempting to spell names. There were no composed texts in the form of coherent sentences, he copied words and attempted to spell names.

During this phase Steven demonstrated his reliance on existing models of text, he copied from cards, the desk labels, my print, his own print, and from the screen. This use of already existing models later spread to other sources in the environment and included, books, library worksheets, charts, posters, the board, and his own workbook texts.

The following literacy related behaviours were observed:
Firstly, he still cleared the screen by using return to move text out of sight, he required a 'clean sheet' to work on.

Secondly, he showed concern about letter forms, in session 8(30.7.87) he looked for the small 'a' on the keyboard. I showed him upper and lower case but his problem was the different form of the written 'a' and the printed 'a'. He kept alternating between the two but it was not "the same". He asked "How do you get the small h when you press H"? I explained although he was already familiar with the change of case. He took my pen and wrote small letters on my notes to show the letters he wanted and the difference between upper and lower case. He wrote n, a(like a reversed p) A, hH. For example in session 16(3.12.87), he typed MPrk for Mark, he used P for A, he selected the p because its form resembled his written a, even though reversed. He was not conserving the different forms of letters he was at a stage where only one form was acceptable and the A/a on the keyboard bore no resemblance to the printed small a he was looking for.

Thirdly he showed that he was recognising and orienting letters correctly in session 9(8.6.87) when he started to copy from a card POISON, he had it upside down and typed NO and then realised it was upside down. He turned it round and copied POISON.

* In the same session he asked for assistance and relied on my help when he asked "How do you write Pizza Hut" then "How do you write your name? and Your husband? Kids?" and copied from my print. This may have been the beginnings of early composing. It showed he was starting to think of topics to write about even though he was not putting sentences together.
Prior to this he had been selecting words to copy from print in the environment but not thinking of them himself. Another possibility is that it marked his development of an awareness that oral speech can be written down and read. He later deleted most of this text.

*He typed ST then wrote 'even' on my notes and completed his name on the computer but used u instead of v although he had written 'v' clearly. He was gaining control of his first name at this stage. He still approximated his name in session 10 but in session 11(10.9.87) he approximated his first name on the computer then wrote both names on my note pad (he overwrote to correct by adding a missing letter in his surname) and copied correctly on the computer. He continued to use 'p' for 'a' and 'u' for 'v' for some time when typing but it was a letter selection aberration, he did know how to spell his name.

* He demonstrated his growing letter recognition skills in session 11(10.9.87) when he typed W for M then corrected and searched deliberately for a card and recognised YES when he found it.

* He also showed that he was making connections between what he typed on the computer and the word cards (large print on show cards) and between words on the cards. For example he had typed his name on the computer in session 11 and added a number, he told me "That's my phone number" he then looked through the word cards and selected PHONE NUMBER to copy. In the same session he copied NO from a card then deliberately looked for YES, this seemed to indicate he was making links between words.

* He knew some of his classmates names and could recognise some words by this stage. He was also beginning to associate sounds and visual appearance. For example in session 12(29.10.87) Michelle was using the
computer and asked him "How do you spell honey?" He wrote "Tony" on my note pad and said "It sounds like Tony", he pronounced "Tony" with an 'oh' sound. Obviously Tony and honey do not sound alike unless mispronounced and this was not the case. He may have been trying to convey 'they look alike' and inferred therefore they must sound alike, or it may have been a slip of the tongue. I think one of these options is the most likely explanation but he certainly recognised some similarity between the two words.

*Steven selected a book in session 13(5.11.87) and copied the cover title accurately and read "SANTAS BOOK". He turned the pages and showed me the illustrations and named the rhymes. He selected 'Humpty Dumpty' and we read the rhyme together. He then copied the two word title but lost interest and did not continue. This was the first time he had a displayed reading behaviour with a book.

**Phase 3, March 10 to June 23 1988.**

During this phase I observed Steven for ten sessions for periods of ten to twentyfive minutes. During these sessions he composed five texts ranging from three to eleven words and one to two sentences. These texts covered the following topics: A gift for mum, family members, expression of personal feeling, his teacher, researchers function.

Steven's periods of sustained interest increased in length during this phase, this was evident in the longer the periods of time he spent on the computer. If he made an error or was not satisfied with his typing he deleted and retyped.
He showed an awareness of text in the environment and an ability to compose from life experience. There were still some problems with letter orientation. For example he still used beginning letters of words to prompt his search for letters on the keyboard and wrote on paper to assist his text. He continued to use i for l and p for a. He also displayed an ability to link illustrations to words and to 'read' from books. He realised this was an important achievement and called the teacher over to show her his prowess.

It was also during this phase that Steven started to really take notice of the date and it's representation.

The following literacy related events were observed during this phase:
* Steven wrote his name in reverse order from right to left on the right hand side of the page 'nevets', the spelling was correct though in reverse order. Later in the session he asked for help with some letters and wrote the names of his teacher and her assistant and copied from his print onto the computer. He then wrote his own name in full. In Steven he reversed the E's but in his surname the E was normally oriented. In his surname he wrote two N's by mistake and overwrote the first one with an 'a' using the small form although the rest of his printing was in capitals. He then copied from this and typed his name correctly and used A not P. This seemed to indicate that he was beginning to overcome these problems. In sessions 21(5.5.88) and 26(23.6.88) he again used P for A in his name but by September this behaviour had disappeared.
* I first observed evidence of reading by linking known concepts to words.
This event seemed to indicate that Steven was beginning to take notice of the scaffolding I was providing. He was able with the support given to link the illustrations in the book to the related words and could then construct the meaning from the illustrative cues. The concept of colour linked to the words enabled him to make the cognitive association. He could achieve more with a little prompting to think it out for himself than he would have done alone (Vygotsky, 1978). He knew he had done well and wanted the teacher to know - the authority audience.
*Steven composed from life experience:

Cameo 2

In session 21(5.5.88) he told me that he had bought soap for his mum for Mothers Day. He wrote on my note pad 'SOAP FO MU' then 'DAD' underneath. He copied this on the computer and asked for help to spell 'FOR' but added the M at the end of MUM himself.

He wrote B B A with B's reversed for 'baby' then his brother's name and surname on my note pad. Steven started 'C' for Christopher then asked for help and I completed it for him. He then wrote his own full name with some overwriting to correct errors in all of these and then typed all three names on the computer. He still used P for A in names but not in other words. He added the names of all the family after the original text about mum.

Later, in session 23(19.5.88) Steven asked me to write the teacher's name and copied this onto the computer then added 'ISMT' and said "is my teacher", he deleted this and retyped as 'TURNESMTE' making an attempt to approximate 'is my teacher', he then asked me to write 'teacher' and copied it. He asked me to write his orally composed text 'Mrs Cook is the computer lady' and copied it onto the computer, he made one error in his copying and did not use spacing.

In the above examples Steven demonstrated a number of ways he was progressing in his literacy learning. He used temporary spelling then asked for help to correct a perceived error. He asked for help to start his text then tried placeholders, progressed to approximation, then settled for copying to achieve his purpose.
In the two sentences about the teacher and myself it seemed that he formed a connected text which served the function of identifying the roles of each individual. 'Mrs T is my teacher. Mrs Cook is the computer lady. 'It was an informational text and was the most complex sentence construction he had undertaken. This cameo encapsulates the strategies he had developed and the various ways he used whatever means were at his disposal to express his intended meaning.

- temporary spelling
- asking for help
- placeholding
- approximation
- copying

Harste, Woodward and Burke (1984, p 180), argue that in written language and written language learning "any literacy event provides a variety of demonstrations which are available to language learners through the actions of the participants and the artifacts of the process." The active learner utilises such demonstrations.

Steven showed by his actions that he had learned a number of ways to achieve his semiotic goals.

Smith(1982, p170), states that "...it is through its uses language is learned. We learn the conventions of writing when we have a use for its conventions ourselves or when we understand the use that others make of them."

Steven showed by the processes he used to make meaning that he was 'engaged' in language learning and was beginning to find uses for written language.
Steven went through a series of stages in dealing with the date and its representation. In Phase 1 it was apparent that he knew the day and the month formed part of the date but he was not conserving different representations. By Phase 2 it seemed he had accepted that there were different ways when he copied the abbreviated date from the screen. In this phase that seemed to be consolidated when he copied the date in full from the board '10th March 1988' then the next week copied the abbreviated date from my notes in session 18(17.3.88). He copied the full date from the board in session 19 and 21, but in session 22(12.5.88), he said "Cross the date out its not the eleventh today" (I had typed 11.5.88.). Steven deleted this and replaced it with 12.5.88. He was right I had made an error. He showed that he was now conserving by retyping in the abbreviated form, he demonstrated that he knew 12 represented the day.

However, the next week he copied the date I had typed 19.5.88 but said "Its not the fifth " and deleted 5.88 and typed 1988. He had not transferred the knowledge about the month as he had for the day. Steven copied the full date from the board in session 24(26.5.88) but in session 25 he produced 1988r6. This change marked the transition from copying to attempting to type the date himself. In Phase 4 he typed only 1988 for the date but by May in Phase 5, session 36(5.5.89) he had the date well under control. He typed '5may 1989' independently and added 'friay' underneath after checking the spelling on a wall chart. By this stage he knew, the day, the month and the year were all elements of the date and he was transposing this knowledge as shown by his addition of the name of the day to complete the information he was giving. He also demonstrated conservation in the next session (19
5.89) when he typed the date as '1988 19 MAY' placing the elements in a different order but knowing that the representation was still valid (he insisted on leaving 1988 although he knew it was 1989). In session 38 the date was recorded as '28.7.1989. JULY'. After this he used the abbreviated form.

Phase 4, July 27 to November 24, 1988

During this phase I observed Steven for seven periods of fifteen to twenty five minutes. During these sessions he remembered and typed two three word sentences using sound and visual memory. He typed a number of sight words (see Graves, 1981, p 58), and copied from different sources in the environment. The topics he used were mainly from previous lessons and library sessions, he was transferring learning in other contexts to the computer.

This phase was characterised by a reliance on copying and typing words from memory and the use of the sound of the words to aid his spelling. He paid considerable attention to spelling during this phase. He did not compose new text, but used topics from other contexts as a source of text. He also demonstrated his knowledge of the letters of the alphabet.

The following literacy related behaviours were observed:

*In session 27(27.7.88) he used words from a library lesson and words from the board as a source of text. He did not compose but was attending to the conventions of spelling. He set the words out in columns, using the space and cursor keys to move to the position he wanted.
Cameo 3

Steven said "I'm trying to do mouse" and typed m, he then said "What's next? - o" deciding himself. He again said "What's next?" and pronounced MOUSE slowly, he knew there was another letter, we both pronounced the ones it might be A E U, he needed help with U. He pronounced MOUSE again emphasising the phonetic units and decided "S' and typed that, he again asked "Next letter?" but typed E and changed to upper case. He typed C then asked "What's the next letter for cat?" but he pronounced CAT and said "A for Adam, T for Tony and completed the word unaided. Steven then said "Rabbit R" and asked "Is it U for umbrella?" I supplied A, he asked for the next letter but typed BB himself, he had difficulty with the vowel so I told him "I". He pronounced RABBIT again slowly, emphasising the phonemic units and completed. He continued in this way but used temporary spelling DUD for DOG then said "Where's g for dog? It's G for girl, he did not correct but typed G after his approximated DUD. He then decided "I don't want to do all animals, going to do mum, he typed M , said "A for apple" and typed MAM then approximated DUD for Dad. He said "Boy bird", typed B and copied OY from the board, then typed a row of G's for girl then deleted this but retyped BOY then copied GIRL from the board. He typed i for l at first 'giri' but he knew it was wrong. I said "It's L " he said "L for Levi" and found l and corrected to giRL. He copied DAD from the board and read all the words from the screen. He initiated this himself, pointing to CAT, then as I pointed to different words he read them. He typed MUM and said "That's the next letter" pointing to U. (He obviously realised his first approximation was different.)
He then asked the teacher to come and see what he had done, he read all the words to her pointing to them on the screen himself.

This cameo highlights a number of gains Steven had made. His use of library and class work showed he was using knowledge gained in other contexts as a source of text and transferring learning from one setting to another. He set the words out in columns, modeling the formats from the board and books in the library session showing the linkage between his text and work in previous lessons.

He was aware there was a conventional way to spell and was making corrections when he perceived the visual representation to be wrong. He demonstrated this when he corrected 'giri' to girl', he had used the capital 'T' for small 1, it was the letter form he had mistaken not the spelling. He also demonstrated this clearly in session 30(25.8.88) when he copied SIIIY for Silly, using capital I for I. He deleted back after looking at this and deciding it was wrong and retyped as SIIY, using the small 'i' to change the appearance, he still used the capital 'T' for 'l' but had corrected the 'wrong' look. He also demonstrated that he was beginning to use sound (phonemic segmentation) to help his spelling. He showed by reading the words from the screen that his reading was improving.

* Steven demonstrated that he knew the letters of the alphabet in session 29(18.8.88) when he copied from charts. He missed the I then deleted back to correctly insert it. When he looked as if he was going to type U after Q I queried it, but he replied "No I'm doing R" and then said "where's W?" but found it himself. When he came to Z he said "the last letter is Z ".

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*In this phase Steven demonstrated that he was transferring learning from other contexts in sessions 30(25.8.88) and 31(1.9.88) when he based his text on library materials and associated words from the board used in class. In session 30 he typed 'JUMP' independently then copied from his library worksheet. He typed the last part 'I CAN JUMP' after reading it from the sheet, without help by pronouncing the words slowly and spelling from sound. He already had JUMP in memory but he checked this spelling with his previous spelling on the screen (again showing attention to correctness). He displayed similar behaviour in session 31, when he said "I know all the letters for walk" and typed WALK, then copied the main text from his sheet and typed 'I CAN WALK' using sound and his sight word WALK for the last section.

*Steven showed evidence that his reading was improving in sessions 30, and 31 (above) as he read from his library sheets and the board and again in session 33(24.11.88) when he read names from previous texts pointing out "Melissa, Kim, Steven, Emma" on the screen as he moved to the end of his file.

*He also showed concern about the difference in the letters on the computer in session 32 when he pointed out that the small 'a' on the machine was not the same as on the card he was copying from. In session 33 he wrote CILOCk on my note pad and overprinted the small k with a capital (he wrote the small letter like an R on a long vertical stroke). He wrote two small k's and two capital K's and said "This machine does'nt have one like that (pointing to the small k he had written) only that" (pointing to the capital K).
Phase 5 March 10 to May 19, 1989.

During this phase I observed Steven for four sessions for periods ranging from fifteen to twenty five minutes. During these sessions he composed three texts ranging from three to ten words and one to two sentences. These texts ranged over the following topics: His name and age, Spinner, What mum and dad would wear.

During this phase Steven began to compose his own texts, some were deleted as he changed his mind about them. He showed an interest in numbers and used word cards to help to put a sentence together.

This phase showed how Steven was beginning to grasp the rudiments of writing, he had overcome his problems with letters and started to experiment with words.

The following literacy related behaviours were observed:

*In session 34(10.3.89) Steven wrote on paper 'NIKC and Mssa' then changed that to Meissa. He wrote SICK and said "That's how you do Nick's name" but when I asked him what it said he told me "SICK". He was using a like sounding word to help spelling, he recognised that his original was not correct. He typed 'STEVEN VE----- 9' and said "That's how old I am". He had his name correct by this stage and no longer used P for A.

*In session 35(21.4.89) Steven placeheld SPSR and asked "Is that how you spell spinner?" I typed SPINNER to show him, he copied it underneath and added 'IS TO SPINNER', then moved down a few lines and typed 'spinnn' and said "That says to spin". He had taken the root of the word and used it
differently. It seemed as though it may have originated in an exercise book but he had no text to copy from.

*In session 36 Steven selected some word cards and looked through them for ideas. He said "I know Mum" and typed 'MUM', he copied WHAT from one of the cards then HAT and said "I could write Mum what clothes is she wearing". He typed 'HAT' and looked for other words to make a sentence and typed 'WILL'. He deleted all of this and typed 'MUM' he copied 'WILL WEAR' then typed 'AN HAT' himself without referring to the cards. He then turned the card over and said "I don't need that" and typed 'DAD WILL WEAR AN HAT' he did not copy from the screen but typed this from memory.

Phase 6, July 28 to October 27, 1989.

It should be noted that in 1989 the number of observations was limited by various school events and also some records were deleted.

During this phase I observed Steven on four occasions for periods of ten to thirty minutes. During these sessions he composed two texts of fifteen and eighteen words and three component sentences. One was in a letter like format, taken from a hand written text but not copied. The topics of these texts were a class mates absence and a letter to a school he had visited.

During this phase Steven clearly showed a marked improvement in his composing, copying and reading skills. It was obvious that he had overcome his earlier problems with letter recognition and this resulted in a much more confident attitude to his writing. He copied lengthy texts accurately,
and paid great attention to correcting any errors when copying. He expanded the length of his own texts, adding further explanatory detail as he continued to follow a theme.

During this phase Steven demonstrated his improved literacy skills and knowledge in the following ways:

* In session 38(28.7.89) he started to type the date as 8, realised that was wrong, read the date from the board and corrected to '28.7.1989'. He then started to type 'ju', deleted and typed JULY. In this event he showed that his reading was improved, he recognised errors and knew how to correct, and he knew that the month should have a capital letter.

* Steven showed his developing competence in composing, his versatility in scrounging assistance for his texts and his editing skills when he typed a text about a class members absence.

Cameo 4

* In session 39(1.9.89) Steven wrote 'KIM' on my note pad, then said "I can do that in one go" (meaning he could type it directly on the computer) and typed 'kim is sik' (he changed to lower case to get the "dot on the i"). He asked is that how you spell sick?" I answered "There is another letter with the same sound as K, you need that". He deleted and retyped 'kim is sicck' and continued 'kim way today', then said "I know how to spell Friday" he typed f then checked on the board and completed 'friday'. He typed 'Emma' then asked for help to spell 'Hayden' he pronounced WANT slowly and spelled from the sound, then continued 'kim to km bak to skool.' again pronouncing the words to spell. (He went back and corrected 'to' after first typing t)and put a stop at the end of his sentence.
His text read:

km is sick

way to day friday emma and hayden want km
to km bak to skool.

He used additional spaces to spread his text out over three lines. He said "Is that more than Melissa's story, how much did she do? I'm going to write a long story and print all of it." He then got his hand written story about running at the Special Olympics and copied from it, spelling some words without copying and editing some from the text. 'I am going to sydney to run (he typed 't' the first time but noticed the error when he typed 'to' again. He went back and corrected it. He typed 'My dad said weare going to have A BAR B QVE THERE I WAN TO WIN MY RACES I WANNT TO HAVE FUN.' When he had finished he said "Mine's a very long story, further than Melissa's, I am going to print it all". He read it from the screen for the teacher, he needed prompting for two words.

This was a very revealing episode, there is a wealth of information here. Steven showed how he used all of his skills in using strategies of asking for help, copying, using the environment, temporary spelling and phonemic segmentation to support his text. He had the knowledge of where and how to seek help if he needed assistance with his spelling.

He chose a theme for his text and expanded it with additional information. This indicated that he knew how to select a subject and then build a text around it. His use of stops showed his attention to conventions although he neglected capitals in this instance. His knowledge of editing was apparent in this episode, he liked to have it right, and often deleted whole texts and
retyped until it was to his satisfaction. This cameo also revealed his developing awareness of the element of prestige attached to producing text. He displayed a competitive attitude and was intent on producing the lengthiest text. He called the teacher over to show her how much he had done. He wanted an audience for his achievement.

*In session 40(20.10.89) Steven used an existing text as a model but did not copy all of it. He read the text, spelled many of the words again as he typed and then checked the text again. He typed the date and used it as the start of his 'letter'.
* He read a story from a book and then decided to 'write it'. He typed some of the words without checking the book, for example, he said "moose is easy" he pronounced it slowly and typed it without referring to the book.

**Theme 2 Cognitive Strategies**

Steven showed a more gradual development of the use of the strategies identified by Cambourne and Turbill (1987) than other students. This I believe was due to his lack of letter recognition skills in the early stages. Evidence of this was observed when he spent considerable time learning to associate letter symbols with words and using this as a cue for letter recognition. He asked for help, but not as consistently as other students. He relied mainly on copying at first. He used different sources in the environment and also used placeholding, but he started to use word sound and visual memory at a later stage than others. Consequently his composing skills lagged behind that of the other students. However, once he had
overcome the problems associated with letter definition he followed the same modes as the other students and his progress accelerated noticeably.

**Phase 1**

During this phase the following behaviours were observed:

* He could ask appropriate questions, he asked for help to find letters on the keyboard and would say "What's next?" when he needed a letter to help his spelling. For example in session 4(30.4.87) he asked for help with letters as he typed his text.

* Copying was a major factor in the early stages and continued throughout the period of Steven's participation in the project. He proceeded from copying single words as for example in session 3(26.3.87) in this phase, when he copied his name from his desk, to copying complex texts towards the end of the project. For example session 41(27.10.89) when he copied from a book and put in stops, commas, inverted commas and question marks.

Steven used placeholding as a strategy to express meaning which indicated that he knew symbols represented meaning. Sometimes he used the beginning letters, sometimes added letters in the word to this, and sometimes seemed to use the length of the word as a guide to how many letters to type, at other times he typed letters randomly.

* He demonstrated this strategy in sessions 1, 2, 3 and 7 in this phase and in sessions 8 and 15 in Phase 2, sessions 22 and 26 in Phase 3. For example in session 2(19.3.87) he placeheld 'wm' (mummy), 'nm'(daddy), and 'mhhghhhjhhhh'(Mathew). In session 3(26.3.87) he typed 'ZXC' vocalised "X"
as he typed (he obviously recognised this letter), then said "That says zebra". In session 7(2.7.87) he typed KKK placeholding "Mrs Cook" in session 8(30.7.87) and 'Rnch' for (Rachel). In Phase 2, session 15(26.11.87) he typed a long string of random letters saying as he did so "That says: Going to Shellharbour Square to see Santa Claus."

This behaviour faded for a while during Phase 2 while Steven concentrated on copying from environmental sources, and had disappeared completely by Phase 4 when the use of phonemic segmentation and temporary spelling were observed.

*Evidence that Steven was making use of print in the environment appeared when he copied his name from the label on his desk, checking each letter in turn, in session 3(26.3.87). Use of print in the environment was also observed in sessions 4, and 6 in this phase and sessions 8, 9, 11, 12, 13 in Phase 2. This use of existing models spread to other sources for example in session 6(4.6.87) he copied the date from the board, and copied a sentence from a printed card. In sessions 8, 9, and 11 and 12 he copied from word cards (these were a series of cards with words considered to be important for students to know printed on them, kept in a box in the class room). In session 13(5.11.87) he copied from word cards and a book. Steven also extended his use of the environment to the computer screen, class notes and his writing projects. This strategy continued to be used throughout the period of his participation in the project. Steven used the environment to provide a source of text and to support his text. Further details of his exploitation of the environment will be presented in the next chapter.

*The first evidence of intertextuality was noted in this phase when Steven identified the letter B as "That's eight" in session 3(26.3.87). He then typed
numbers and named each one, he jumped from 4 to 8 and said "That's how old I'm going to be". Intertextuality (text to life) was evident as he made the connection between the numeral and his information about his age, showing his ability to use abstract thought and relate concepts outside of the class situation to his text. In Phase 2, session 11(10.9.87) an instance of intertextuality (text to text) was observed when he wrote his phone number after his name, and told me "That's my phone number", then selected a card to copy which had the words 'PHONE NUMBER' on it. This behaviour was not noted again until Phase 4, in sessions 27, 30 and 31 when he transferred learning from a library lesson to his text. For example in session 27(27.7.88) he typed words he had heard and seen set out in the library session to form a text but added some of his own words. Steven's use of intertextuality was not very evident, in the period between session 2 and session 4 he tended to rely more on copied text, as indeed he did during all of the first four phases.

**Phase 2**

During this phase Steven continued to use the strategies previously identified, he extended his use of the environment to copying from the computer screen, from word cards and from books.

In this phase Steven demonstrated that:

*He could copy fairly accurately from a number of sources.

*He could relate knowledge gained in one context to other contexts. For example in session 11(10.9.87) he copied NO from a card, said "Yes" after he typed and searched deliberately for the card with YES and recognised it when he found it. He seemed to have the knowledge in memory that linked YES
and NO and used it to select his text. This also showed he had some reading ability as he recognised the word he wanted when he saw it.

*He was aware that resources in the environment could provide literacy models. For example in session 13(5.11.87) Steven copied from a book cover and from the book as well as from word cards.

**Phase 3**

In this phase Steven consolidated the strategies established earlier. His use of beginning letters of familiar words to aid the location of letters on the keyboard became apparent during this phase. This phase also marked the beginning of his composing skills. He began to put sentences together whereas previously he had relied on copying or typing words without a story line. To do this he used all the strategies he knew.

The following demonstrations were observed:

*Steven used the beginning letters of familiar words to help him to identify letters on the keyboard for example session 18(17.3.88) he looked for E on the keyboard and located it when he associated it with "E for Emma".

*He began to copy whole sentences where previously he had copied words. In session 18(17.3.88) he copied a complete text from a card 'Weshaiisail THROUGH THE YEAR WITH birthdays heranbthere' He showed great concentration and his attention was engaged much longer than usual.

*He wrote on my notepad then copied onto the computer.

*He used temporary spelling in session 21(5.5.88) he wrote "SOAP FO MU DAD" and BBA for baby on my notepad then transferred to the computer. He corrected MUM himself but asked for help with FOR then typed BAB for
baby. He typed 'soap for MUM    DAD    BAB' then all the family names. This behaviour was again observed in session 23(19.5.88) when he started by placeholding with first letters ISMT then attempted an approximation of 'is my teacher'.

**Phase 4**

During this phase Steven added the strategy of using phonemic segmentation to his repertoire of behaviours. He continued to expand his use of the environment and showed evidence of intertextuality. Placeholding had been abandoned by this stage, he either attempted temporary spelling, sought help or copied.

The following behaviours were observed:

*Using sound (phonemic segmentation) to aid spelling, for example in session 27(27.7.88) Steven pronounced words slowly emphasising the phonemic units and obviously used the sound to help his spelling. He asked for some help when he had difficulty distinguishing the sound as in determining the 'U' in mouse, the rest of the word he typed from sound and visual memory. He typed CAT using the sound and also saying 'A for Adam, T for Tony' to identify the letters. He used the same strategies to spell RABBIT and when he was uncertain of the A sound asked "Is it U for umbrella?" he used a combination of strategies to spell one word, confirming the assertion of Harste, Burke & Woodward (1984, p 96) that one word can involve the use of a number of strategies.

*He associated words across contexts (text to text) in session 28(4.8.88) he showed me a card with the words "THE END' on it, he asked me what it said, but I said "Can you tell me what it says?" He said "The end" and typed
'end'. He then selected a book and said "I'm copying from the book". He found the words 'The end' in the book and copied from that. He was obviously transferring the knowledge that the words were the same and he had encountered them in books before. He also demonstrated the same kind of intertextuality in session 31(1.9.88) when he transferred words experienced in the library session and in lessons to his text.

**Phase 5**

During this phase Steven continued to use the strategies previously observed. The following strategies were variations of some he had used previously:

*He compared like words to assist spelling, in session 34(10.3.89) he wrote NIKC for NICK on paper then later wrote SICK and said "That's how you do Nick's name".

*He used models from other contexts for example in session 35(21.4.89) he started from the word SPINNER then typed IS TO SPINNER below it, then further down the page typed 'SPINNN' and said "That says to spin". It seemed that he was following a format he had seen somewhere before and was examining the word and its meaning. It may have been from class work or a reading book.

*In session 36(5.5.89) he used words from cards as starting points to give him an idea for text. He looked through the cards, singled out a few words, then thought about what he could write. He was using abstract thought, connecting existing text to life experience to construct his text.

Steven selected word cards and said "I know mum" and typed MUM, he copied WHAT from one of the cards, then HAT. He looked through the
cards and said "I could write Mum what clothes she is wearing" he typed HAT and looked for other words to make his sentence, typed WILL. He then deleted all of this and typed MUM (sight word), he copied WILL WEAR from cards, then typed AN HAT (sight words). He then turned the card over and said "I don't need that" and typed 'DAD WILL WEAR AN HAT' without referring to any external cues.

This event signalled a growing independence in Steven's literacy. He used the cards as scaffolding to help his ideas but discarded them once he had gained the pointers he needed from them.

**Phase 6**

During this phase Steven demonstrated his continued use of the strategies of using the environment, phonemic segmentation, copying and asking for help. He also demonstrated an increasing confidence in his ability to write. He chose his subjects himself and extended his time on the computer to complete texts.

The following behaviours were observed:

* Steven chose to copy a number of quite lengthy texts, he paid particular attention to accuracy and deleted to correct, often retyping three or four words until he was satisfied with the result. For example in session 40 (20.101.89) he copied a text from the board accurately and in session 41(27.10.89) he copied a text from a book. He made a number of corrections on both occasions.

* He used the environment by copying from existing texts, for example his hand written texts from class work, books and texts from the board. Steven also used print in the environment to support the construction of his texts.
Steven explored the computer from the start, he pressed the keys and watched the screen to see what happened. He used function keys and asked what they did, for example in the first session he tried the shift key and when there was no result on the screen he asked "What does it do?" Once he had been shown how to delete, he deleted most of his first attempts to type and often spent time deleting and retyping. He quickly learned that he could move the cursor by pressing the space bar or the cursor (arrow) keys. He moved his text around the screen until it was positioned where he wanted it using the space bar and cursor keys.

Once he had explored the keyboard and how it worked he was curious about the machine itself. He asked questions about how to switch on and where the connecting cords fitted. He liked to help to set up the machine, Steven also liked to help me to carry it in from my car (I would ask him to carry the connecting cords and the disks) and to return it after the sessions were over. Steven made the connection between action at the keyboard and result on the screen from the start of his participation. During the period that he was involved in the project the following behaviours were observed:
* he observed what happened on the screen when he pressed the keys;
* he moved text up the screen to start with a clear screen;
* used the shift and caps lock keys to change case from the start, he had some difficulty co-ordinating the two keys and at times tried several times to get the result he wanted. He eventually worked it out;
* he had difficulty with the form of some of the keyboard letters and used i for l, u for v, a for p for some time, he eventually overcame this problem;
* consistently used spacing to set out his texts;
*discovered the symbol keys and how to use them by asking questions. For example in session 6(4.6.87) he found the question mark on the keyboard but when he pressed it / appeared and he wanted to know why. I explained that he had to use the shift key to get the upper symbol. He remembered the next time he needed the question mark;
*used text on the screen to aid spelling;
*demonstrated his reading progress by reading from the screen.

Phase 1

During this phase Steven explored the keyboard letters and numbers, he discovered the use and functions of shift/caps lock keys, delete, return key, and the cursor keys. The fact that the keyboard letters were capitals was not a problem except in the specific instances noted. In these cases it was actually the small form that was the problem as for example the capital I was mistaken for a small 1.

The following behaviours were observed:
* he used the delete key to 'rub out'
*he used spaces between words
* he used space bar and cursor keys to move to different parts of the screen, after he asked "What does that do?" when he used the arrow keys in session 3(26.3.87);
* he used the shift key and caps lock to 'get big letters' (or little letters)
* he used the return key to move text up the screen in sessions 4,5,7 and 8;
* he could find most letters on the keyboard but confused some;
* he located the question mark on the keyboard and learned how to obtain the upper symbol on the key.
Phase 2

Steven showed concern about the difference in some letters on the computer, particularly the small 'a'. In session 8(30.7.87) he examined the difference between Aa on the screen but the small a was different to his written small a. He asked "How do you get the small h when you press H?" He was familiar with the use of the shift/ caps lock keys to change to big or small letters but he still had some difficulty coping with the difference in letters. During this phase he copied from typing on the screen accurately, he also copied from cards. He used the space bar to separate words and began to use return to separate texts instead of clearing the screen with it. He still tended to clear the screen of earlier work during this phase but he no longer cleared it between typing episodes in the current weeks typing. He also began to use the stop when copying. He inserted the disks in the drive and switched on the computer to start the program.

The following behaviours were first observed in this phase:
* he used stops for the first time in the abbreviated date he copied;
* in session 14(19.11.87) Steven said "First next line" and pressed return to move down before starting to type;
*in session 10(3.9.87) and in session 19(14.4.88) in Phase 2 he used the shift/caps lock key purposefully, when he said "I want the big one" before he attempted to type his name in session 10 and "Can I get the big one for April?" in session 19;
*he used the delete key to make a correction in session 13(5.11.87) when he typed 8 and 9 in the wrong order, he made the correction by deleting and retyping.
Phase 3

During this phase he used the delete key often to delete and correct, often just to make a change if he did not feel happy with what he had on screen. He used the cursor keys to move back over text to make a correction without deleting all the text for the first time during this phase. He also tended to spend time re-arranging the spacing and moving text. He continued to use return to go to the next line and to format texts he copied from books.

The following behaviours were observed:
* he used the space bar, and return to format a text he was copying to look like the format in the book;
* he used cursor moves to edit in sessions 24(26.5.88) and 25(2.6.88);
* he used the stop after asking "Where's that little thing you put in -a dot?"

Phase 4

In this phase he began to use the cursor keys to move to the end of his file. He continued to use the space bar and return to format and improved his control of the use of the shift/caps lock keys. He found all the letters of the alphabet on the keyboard and used the shift key correctly to put exclamation marks in his text. He continued to use the cursor keys to move to the bottom of his text. He showed his observational ability by pressing the ESC key to go to the transfer menu to save his file.

The following behaviours were observed during this phase:
* in session 27(27.7.88) Steven used the cursor moves to go to the bottom of his file and used the space bar and return key to set his text out in columns;
*in session 29(18.8.88) he typed all the letters of the alphabet, he corrected an error by deleting and retyping;

*in session 31(1.9.88) he put exclamation marks in his text, he remembered how to use the shift key to get the upper symbol;

*Steven said "We'll save it now" at the end of session 32(10.11.88) and pressed the ESC key, modeling my words and behaviour from previous sessions. He then followed my instructions to save the file;

* He pointed out that "This machine doesn't have a small k (like his printed one) only a capital K.

Phase 5

Steven continued to use all of the skills of computer use he had developed over the period of time he had been using the computer. He used the function keys with confidence by this stage and had overcome his problems with letters.

During this phase Steven used the shift and caps lock keys purposefully, he knew their function and how to operate them. He used the space bar consistently and no longer moved text around except to format when required.

* He had consolidated all of the skills he needed to operate the computer for the purpose of writing.

Phase 6

In this phase Steven continued to use the computing skills he had established. He could find letters quickly by this stage, he typed his name to retrieve his file (he had done this on previous occasions too but it was not a
regular occurrence). He also added the skill of selecting the procedures to print to his repertoire of computing accomplishments. He used punctuation and could use the symbol keys.

*In session 41(27.10.89) he used stop, comma, question marks and inverted commas almost as in the text he was copying. He asked "Is it supposed to be a question mark or a comma?" but put in a comma (it was a comma) after 'MORRIS ASKED,'. After he completed the text he examined the symbol keys and typed brackets and asked "What are these?" I explained and he asked "Are these brackets in here?" pointing to the inverted commas. He pointed to the - dash symbol and asked "What do you call that?" but answered himself "straight line".

Steven often asked questions and answered them himself. Steven attended to computer functions and then found a use for them. He was interested in what each function key would do and in how the computer worked. I did not set out to teach computing skills as such, I allowed the students to learn how to operate the computer by giving support, by demonstration, by supplying information when requested or perceived to be needed. Above all independence was encouraged by allowing them the opportunity to find their own answers to questions whilst providing the scaffolding to help them to do so when necessary. During his participation in the study Steven learned by doing and by asking questions. He participated fully and I believe, gained much from the experience. He was able to load the disks, and switch on the computer under supervision. He could retrieve his file by typing his name, and move to the end of the file himself. He could save work and print with some guidance, and although he always tried to operate independently, he knew when to ask for assistance. In addition he was able
to operate the computer for the purpose intended, for the actual writing process. He had learned to cope with the keyboard configurations and could format a text to his own satisfaction, he could competently use shift space and delete keys. He was equipped to continue to use the computer to aid his literacy and other learning.

Summary

During the period of time Steven was involved in the project he used all of the strategies identified by Cambourne & Turbill (1987). He used copying and placeholding almost exclusively in the early stages. I believe this was because he did not have complete letter recognition skills at that time. He knew that words could be represented by marks on paper and by the printed version on the computer. He knew that meaning could be represented by words and that letters made up words but he did not have the skills to define all letters by visual appearance or to associate the letter/sound relationship with the sound of the word. He had problems with reversal of letters and accepting different forms as representing the same letter.

Steven made use of print in the environment from the beginning, using existing literacy models as a source of text but he did not really start to use phonemic segmentation (spelling as it sounds) until May 1988 in Phase 3. His composing seemed to be delayed, perhaps because of this lack of competence in letter/sound relationships and thus in putting words together. He composed one text orally in Phase 1 but it was not until Phase 3 that he started to construct his own texts on the computer. His efforts in the first two phases showed a determination to get the letters 'right'. Once he
had the letter system under control he made progress in his literacy learning.

In phase 3 Steven demonstrated that he had the ability to think abstractly and to work problems out when he associated words with colour blocks in a book, he used visual cues to extract the word meanings. At that stage he was just beginning to link letter/sound associations in words, he demonstrated this when he emphasised the phonemic units of words to aid his spelling. His use of environmental support was always evident, he knew how to scrounge literacy models from a variety of sources. He also became more self reliant in choosing topics. Towards the end of his participation his range of subjects widened, he began to use his process writing materials whereas before he had looked to books and lesson topics. These materials were beginning to show his interests and life experience, for example his recount of going to Sydney to take part in the races. He also showed that he could compose directly from life experience in his text about a member of the class being absent because she was sick. Not only did his inclination and ability to write and compose improve, he took pride in showing his teacher his achievements. The visibility of his efforts was motivating, not only on the screen, he could also print to show the results to a wider audience. He was just at the stage where he was beginning to want to write, he had come a long way from the time when he had difficulties with letters. I believe that once that problem was overcome he began to find his way in literacy learning, and that the computer was a motivating factor notwithstanding the initial problems with some letters.
CASE STUDY 4

Melissa

Melissa had been regularly assessed developmentally from the age of six months because of an early problem. She participated in an early intervention program in a special unit and was referred from there to the special purpose school. Placement was recommended because Melissa was exhibiting an overall developmental delay, her concentration was limited, and she was easily distracted. Her performance on standardised diagnostic tests Stanford Binet administered 11.11.86, and WISC R administered 3.3.89 (part of school records) indicated that she was functioning in the borderline mild/moderate range of intellectual handicap.

Melissa was five years old when she joined the class in May 1986. She was very voluble, had an extensive vocabulary for her age and her articulation was good. She had a repertoire of set phrases, a rather 'adult' conversation mode and she liked to do things in her own way.

The data which was used to construct Melissa's case study was collected from May 1986 to November 1989. It came from a total of fifty two sessions of twenty to thirty minutes during which time I observed Melissa and conversed with her as she composed text using a computer as a writing tool. Melissa was very chatty and carried on a continuous conversation. She would start with "And how are you today Mrs Cook" and go from question to question or news item to news item.
In the first session at the computer she typed with both hands, jabbing at the keys with one finger, but obviously imitating someone using a typewriter. She also tried to roll paper into the computer as if it were a typewriter. She pressed keys randomly and did not seem to connect them with letters, words or speech. I typed 'Melissa' pointed out that it was her name and tried to get her to copy from my print to see if she recognised letters. She did not seem to recognise the letters as her name. The next session she behaved in a similar fashion, and still did not show evidence of letter recognition. She did however, show interest in the computer and she obviously recognised that what appeared on the screen was related to her actions on the keyboard.

**Theme 1. Literacy Development**

**Phase 1, 19 May to 21 November, 1986**

During this period of time I observed Melissa for a total of six sessions ranging from fifteen to twenty minutes. During these sessions she composed orally four single sentence texts ranging from three to five words. The topics included: Mummy's car, Melissa likes..., a house, children at camp.

A typical session began with 'good morning greetings' and some news items. In the first few sessions she did not like to be shown how to do things, she would insist "I can do it myself". Melissa typed randomly and moved around the page a lot either using the space bar or other function keys but not in any purposeful way. Data collected from these literacy events
showed that Melissa had the following literacy related skills and knowledge at this stage in the project

(i) Knowledge that:

* spoken language could be represented by written and pictorial form

* written language was made up of various units 'words' 'letters'

* letters had specific names sounds and shapes but she had difficulty linking some of them at this stage

* her own life experience could be recounted in oral and written form.

(ii) Skill in:

* orally composing a coherent text about her experiences;

* recognising some letters by name and associated sound in both capital and small forms;

* naming components of pictorial representations for example she named "roof, door, windows, garden, bird" in a drawing jointly executed in session 5(23.10.86).

During this phase I first observed Melissa attempt to copy from print and to use the environment by copying from the computer screen. She employed the strategy of placeholder for her orally composed texts and showed by this that she knew that her 'story' was represented by letters.

The following literacy related behaviours were observed:

* Melissa attempted to type her name as I pointed out letters in session 3 (7.8.86). I indicated M, she typed it, then typed W and said "My name doesn't start with M", she made this assertion a number of times. In session 4(18.9.86) she asserted "it begins with A", and similar behaviour was
observed in Phase 2 in sessions 10(14.5.87) and 15(6.8.87). She had problems with some letters for example in session 4(18.9.86) she typed G and said "K", in session 10(14.5.87) she typed B for Brendon but said "G". This behaviour was noted on a number of occasions in the early stages but by Phase 3 it seemed to have been overcome.

*Melissa said "I'm going to write Melissa likes the computer" and typed this with assistance with letters pointed out for her, she knew her text could be typed on the computer and made the decision 'to write'.
*She decided to write about a house in session 5(23.10.86) and asked for help to draw it. She then named the different parts and asked me to write as she told me what to write. "Roof, Door, Windows, Garden, Bird." This demonstrated that she knew the pictorial representation could be expressed orally and her spoken words were represented by typed units (letters and words) on the computer.

By the end of this phase Melissa had demonstrated that she was aware that letters were symbols which expressed meaning in words. She associated some letters with sound but was not always sure of correct links with form. She could recognise most letters on the keyboard but during this phase and Phase 2 she had some difficulty with similarity of form G and C, X and K, 2 and Z. For example in session 8(26.3.87) Melissa typed G and said "C", then typed Z and said "I did 2 already".
Phase 2, 5 March to 4 June, 1987

During this phase I observed Melissa for six periods of fifteen to twenty minutes. During these sessions she orally composed six coherent texts ranging from three to ten words and one to two sentences. These texts ranged over the topics: age, fire, Mummy's shopping, swimming, days in the week, 'your' computer.

This phase was characterised by the following literacy related behaviours:

* Melissa typed beginning letters of names and words, vocalising the letters and associated words. For example in session 7(5.3.87) she typed rows of k's and said "K for Kim" and B for Brendon and typed a row of b's. Similar behaviour also occurred in sessions 8(26.3.87), 9(30.4.87), and in 10(14.5.87), when she typed 'YUU' and said "That is U for umbrella" and in sessions 11(21.5.87) and 12(4.6.87) in this phase and continued through Phase 3 and into Phase 4. During Phase 3 the behaviour was elaborated by adding additional letters for example in session 17(3.9.87) she said "E for Emma and M for Emma and A for Emma as she typed EM A. In session 20(19.11.87) she typed 'MMMMMMEEEE' and said "Emma".

* Melissa composed coherent text from life experience and began to associate her own typing on the computer with text. For example in session 10(14.5.87) she typed 'B' for Brendon then told me "Brendon is six" and added 6 after the B. In session 11(21.5.87) she typed 4 and said "I did four laps"(swimming). In the same session she told me "I know how many days in the week" she wrote 7 on my notes and said "Seven, 7 days in the week" She typed 7 on the computer connecting her spoken, written and typed information to her text.
*Melissa showed her first interest in the date during this phase in session 12(4.6.87), when she insisted "It's the 4th of June " and that it be changed to that format. In Phase 3 she began to type her own representation of the date, in session 13(23.7.87) she said "I can do it" and typed '7254881 46' and said "that's the date". In session 17(3.9.87) she carried it further when she had been telling me about a birthday on "Saturday 27.8.7. of the ninth" then added "today is the 3rd of the ninth 87" and copied 3987 from the date on the screen. It was in Phase 4 that she really tried to get control of the date when she started to use the board for reference. This will be dealt with in greater detail later.

* During this phase Melissa was mainly placeholding her name but she could also copy it, in Phase 1 she had typed it with assistance with letters pointed out for her and copied. In Phase 3 she relied on copying, it wasn't until Phase 4 that she made independent attempts to write her name and to type it. In session 25(14.4.88) she typed 'meilssa mo----', her second name was correct. A possible reason that she had her surname correct was that it was a recent change, her mother had remarried and she had probably been concentrating on the name change. She then wrote both names on my notes correctly (except for one reversed S), without referring to any source and said "Look Mrs Cook I can do my name". In Session 30 she typed her first name almost correctly on the computer 'MEILISSA'.

**Phase 3, July 23 to December 3 1987**

During this Phase I observed Melissa for nine sessions ranging from fifteen to twenty minutes. During these sessions she orally composed eight
coherent texts ranging from three to twenty six words and one to three sentences and placeheld her address.

During this phase it was evident that Melissa was gaining ground in letter recognition, she was attempting to placehold with letters from words and was attempting to copy from existing text. She had moved from random typing to trying to represent actual words with related letters and also typed placeholder letters as she vocalised her intended text. She was also beginning to display reading like behaviour and intentionality. For example in session 13(23.7.87) she wrote three circle like symbols on my notes and said "That says dog".

<table>
<thead>
<tr>
<th><strong>Cameo 1</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>In session 14(30.7.87) she wrote 'T' then 'TOY SHOP' on my notes but pointed to it and said &quot;Tony E....&quot; giving the words a meaning she could relate to. She used a wiggly kind of script, I think she was imitating an existing model. She did not copy this but wrote it from memory.</td>
</tr>
</tbody>
</table>

There was a similarity in TOY and TONY and it seemed she used this as a cue to infer meaning. The intentionality behind the writing evidenced by her expression of an assigned meaning showed she knew that written marks signify meaning. Harste, Woodward and Burke (1984, p113) argue that whilst Vygotsky's (1978) contention that 'one of the crucial points in written language learning is the moment when the child intends, and then makes marks on paper to placeholder that intention' is an important one, the implication that the representation must be named before it is written to be an instance of literacy is open to question. Their research indicates
intentionality can be inferred without prior naming because by putting marks on paper and inferring that the marks hold meaning a child shows intention to mean.

The following literacy related behaviours were observed during this phase:

*Melissa could copy from existing text at this stage but she also used placeholding as she verbalised text. For example in session 17(3.9.87) she typed W for hospital then typed a string of letters randomly as she said "Grandma has a broken arm, broken chin, broken leg and a sore head." She then pointed to the letters again and added "Grandma is going to have an operation." She was adding to her text but still linking it to the original representation. In session 19(29.9.87) Melissa typed groups of letters and read out as she typed "Get well soon Grandma", she typed more letters and said "'cause we love you very very much and Mrs Cook is thinking of you". She typed still more letter groupings and said "And we hope you get out of hospital." She was following the format of a 'letter' to Grandma, probably modeling her mothers 'writing to Grandma'. Letter writing behaviour was also observed in Phase 3, session 22(10.3.88) when she wrote squiggly writing like lines on my notepad and said "Dear Mrs Bo---- I like you very much."

**Phase 4, 10 March to 23 June, 1988**

During this Phase I observed Melissa eleven times for periods ranging from fifteen to twenty five minutes. During these sessions she composed seven coherent texts ranging from three to nine words and one to two sentences. Her topics ranged over: sore finger, days, friend, boy's action, birthday greetings, the Queen opening Parliament House, her doll, her drink bottle.
During this Phase Melissa spent considerable time on the date, she used the environment to support her efforts on this in most sessions. She also spent time on names and copying from existing texts. She was expanding and consolidating her skills through her texts. Her improved letter recognition showed in her attempts to read as she copied text and in her attempts to type her constructed texts. She used knowledge from life experience in constructing texts by making links with other contexts. Her concentration was improving but she could be distracted by her own chatter and observations as she typed. For example in session 24(24.3.88) she attempted to copy from a text card 'We shall sail through the year with birthdays here and there.' She vocalised letters as she typed 'WASHA (We shall) lost track and typed VVVVVV saying "Y for Yabbie then returned to the text and typed TTTTTT said "Mine's an R and what else? DAD that's it I think" as she typed TH RHBKDAD (through ,birthdays). She then typed DDDDDDD WERREEERHF (here and there)she missed letters and mixed some out of order but she kept looking at other things and then going back to the text. Her comment 'DAD that's it I think" highlighted her reading skills at this stage , she had no context but she visually recognised the letter sequence.

The following literacy related behaviours were observed:

*I first observed Melissa use temporary spelling and the beginnings of phonemic segmentation in session 26(5.5.88) during this phase. This behaviour was also observed later in the project and will be discussed in more detail in the next section;

*Evidence of increased letter recognition skills was observed.
Cameo 2
In session 27(12.5.88)

She had asked me "Do you know in 1988 Queen Elizabeth opened Parliament House? on Monday, isn't that good news?" she then asked how do you write Monday and copied it from my printed version, she asked "Could you show me where Y is?" but found it herself. The rest of her text she typed as I vocalised the letters as she asked "What does Parliament House begin with?" and "Queen?" She typed 'MONDAY PARLIAMENT HOUSE QUEEN'. Evidence of 'reading' was noted when Melissa pointed to this text in the next session and read it as "On Monday Queen Elizabeth opened Parliament House."

Melissa inserted words she had used in the original oral text that she had not typed. This showed that she had not only intended to mean in the first instance but when she encountered the text again she had retrieved the original intention (Vygotsky 1978).

*Editing behaviour was first noted in this phase in session 25(14.4.88) when Melissa wanted to type Thursday. She typed ttt t and said "Oh look my T didn't come out" and changed to T before proceeding. It was again observed in sessions 29(26.5.88), 30(2.6.88), 31(16.6.88) and 32(23.6.88). In session 29 she copied 'THUR S' from the board then asked "Can you take that out please because it's wrong?" pointing to the space between R and S.

She continued copying 'THURSBAY26MYY' then said "That's wrong" and deleted and corrected to 'MAY' and added '9988'. She said "That's wrong,
deleted and retyped as 9188. She did not correct the B. She then decided she wanted to type 'Today is' in front of the date so I showed her how to move the cursor with the arrow keys without deleting text. She typed 'TODAYS1' referring to the board, she said "I've got to get the dotted i, have you got one?" She corrected to 'Si' when I showed her how to release the caps lock key, but she left the letters reversed and then typed a few spaces before the date as on the board. She continued to edit throughout the remainder of the project. It was particularly notable in Phase 5 as she struggled with the date, but in fact from this point on I observed editing in almost every session. For example: MACDNOLDS changed to MACDONALDS (session 44, 7.4.89), JANTHAPPY changed to JANTHAPPY (BTHDAY) (session 45,14.4.89).

It was also during this Phase that Melissa became really involved with the date. In sessions 22(10.3.88), 23(17.3.88), 25(14.4.88), 26(5.5.88), 27(12.5.88), 29(26.5.88), 30(2.6.88), 31(16.6.88) and 32(23.6.88) she showed a variety of approaches.

Firstly, she copied from the board, in session 22 she looked at the board and said "Thursday 10th March" and typed 'THRAUBA10MAHr', inaccuracies were not noted. She then attempted to write 1988 on my notes and produced 01888, she typed '0i88888'. In session 29 she again copied from the board but this time made a number of corrections to errors. In session 30 she copied from the board 'THURSDAY2JUNE9188' (one error and no spacing, she typed 1988 at first then changed it). She said "D for dog d for pup" as she typed D then "Thursday came out really good". In session 32 she typed 'TODAA' then deleted the extra A but typed only 'TODAY THRS'.
Secondly, she placeholder, for example in session 23 she typed '71 (17) HXCCvbnmjads' and said "Today is Thursday".

Thirdly, she attempted to spell from sound, in session 26 she pronounced THRRRRRSJDAY exaggerating the Th and R sounds and typed 'TTHHHHHHRRRRRRT'. In this session she had displayed her knowledge of the function of the date when I asked her did she know why I typed 5.5.88 for the date. She replied "Yes its 5 today then its the 6th tomorrow then the 7th".

Fourthly, she attempted to type the date herself. In session 27 she typed 21 (for 12) then asked "What does May start with?" I told her "M" she then typed 'MAY988' she had the numerals in the wrong order but all were included. In session 31 she typed 'THH' then corrected by deleting, and typed "THURSDY61JUNE9188' vocalised "R for Ricky, D for dog" as she typed those letters. She looked at her typing and said "Oh, Mrs Cook I've done it again" and deleted to correct to 16 and retyped JUNE9188, she did not correct the year.

By the end of Phase 5 she had the date under control, she could type it independently and was conserving the elements in the different formats. For example in session 41(24.11.88) she typed 2411 88 and in session 45(14.4.89) in Phase 6 she typed '14 4 1989' and said "It's the 14th of the fourth." In Phase 7 session 52(10.11.89) Melissa deleted the date I had typed and said "I can do that myself" and retyped 10 11 89.
Melissa had made good progress during this Phase. It seemed that once she started to become more proficient with letters, constraints which had previously operated disappeared and she was able to experiment more with her literacy. Evidence that she had started to use phonemic segmentation and that visual recognition was improving appeared and this helped her reading as well as her writing.

Phase 5, 27 July to December 8, 1988

During this phase I observed Melissa for ten periods of from twenty to thirty minutes. During these sessions she composed six cohesive texts ranging from three to nine words and one to two sentences. The topics ranged over friends, baby, christening, library, jumping, running.

This phase was characterised by a rapid expansion of Melissa's literacy ventures. She added a number of new behaviours to her repertoire of skills. She began to decide what to write, and to plan and follow through a theme whereas previously she would be diverted and break off part way through a text. She read previous work from the screen and texts from library sessions and other print in the environment. She began to approximate using temporary spelling, she used phonemic segmentation and attempted quite difficult words, she edited when she recognised errors. She used material from other contexts and showed evidence of intertextuality and the use of abstract thought. In short she suddenly seemed to get her literacy in focus and to make sense of her world.
The following literacy behaviours were observed:

*She demonstrated her competence with names in session 34(25.8.88) when she announced "I'm going to write Emma" and typed it correctly. She then said "Tony T O Y" then tried again and spelled "TONY" she said "I thought that was missing(N) and typed TONY. She typed two M's and asked me to "Take one out" then completed MELISSA and KIM then typed ST and asked "What else for Steven - E then U." (speech for self). Steven told her "It's V" Melissa said "He's getting me frustrated" and insisted it's not "V" and left the typed U. 'STEUEN', she then decided to type "friends", these are her friends and typed FRE said "E for egg, N D dog" and "S" saying the letters not pronouncing the word.

*Melissa displayed her expanded repertoire of skills in Phase 5, session 35(1.9.88). Melissa had some very important news, her mother was going to have a new baby.

**Cameo 3**

Melissa typed 'BAB' deleted then pronounced BABY slowly emphasising the phonemic units and retyped BAB, she then said "Can I write April?, What does it start with -A -LL?" She typed Al then deleted and typed 'BABAPRLL' then said "The baby's born in April." She then typed 'MELISSA ES' said "S for sister", pronounced 'Sister' slowly and typed 'SBRIST' (Melissa is the sister). She then said 'I'm going to do MY first' and typed 'MYDAD and said "He's going to be another father". She typed JAM' (checked the last letters on a chart and completed JAMES'. Similarly, in session 38(27.10.88) she typed 'hppy' for happy said "That's not right" and retyped as 'hppay' then said "Christening I'm going to write that' and added krestenbaby. She did not use spaces so her text was 'hppaykrestenbaby'.
She showed in these episodes that:

- she could construct text from her own experience
- she was maintaining a theme
- she was clearly using sound to help her spelling
- she was also using visual memory as well as sound, she typed 'Al' then deleted and retyped APRLL and changed hppy to hppay (all the letters)
- she had letters well under control by this stage
- she was using temporary spelling
- she was concentrating on making meaning
- she was planning her text with speech for self
- she was using the environment to support her text.

The interdependence of all elements of language; speaking, listening, reading and writing was apparent in the way Melissa started to link her texts and in the way she organised her texts using speech. Melissa's behaviour was very similar to that observed in research of early writing behaviours as reported by Harste, Woodward and Burke. "Speech produced in the process of writing signaled a plan of action... speech, then, seemingly served an organizational function in writing" for further detail see Harste, Woodward and Burke, (1984, p115).

*Reading progress was demonstrated in session 36(22.9.88) when Melissa brought her story card from the library session and read all of the text. She inserted an extra "She" in front of each line of text, there was a picture of a witch with a tall black hat and cloak and long pointy black shoes. She took my pen and copied the first word from each line of text diagonally across my note pad imitating the sequence on the card. She wrote:

- tall
- longblcak (as she wrote b she said "See this, that's for black")
- cloak
She was very pleased with her reading and kept going back and reading it again, putting a lot of emphasis on the "big Black" -getting the 'witchy' atmosphere. She did not type on this day she was concentrating on the reading and the written format. In session 42(8.12.88) I took along a program called "STORY MACHINE" which was a story writing program with moving illustrations appearing as the words of the set dictionary were typed. Melissa read "Story Machine" from the screen. I typed in a story to demonstrate. Melissa then typed 'THE GIRL JUMPS', she checked the spelling of GIRL on the board but typed the rest herself, then typed 'THE BOY RUNS'. When the stop was typed at the end of the sentence the figures on the screen perform the actions. She read it as "The girl is jumping- the boy is running".

*Melissa clearly demonstrated the use of abstract thought in session 40(17.11.88) when she sat pondering for a while and I said "What are you thinking?" She said "It's a hard decision, I'll do - at 12 o'clock we will get our books". She typed 1200 using zero's then deleted and typed oo. '12oo we v go' then asked "What does library start with? I?" "I've got to do TO". She typed 't' in lower case but changed to upper case then deleted everything and retyped in upper case '12OOGOTOLB'. She read this as "At 12 o'clock we go to the library". She had changed the wording from the original stated intent of 'we will get our books' but it was still implicit in the text. She then typed 'GnGa GNGBAMN' and said that says "Ginger bread man" - approximating from memory.
Phase 6, 10 March to June 2, 1989

During this Phase I observed Melissa for five periods of twenty to thirty minutes. During these sessions she composed seven coherent texts of between five and ten words. One was an advertisement. The topics ranged over: excursion, visit to MacDonalds, Rock and Roll Disco, birthday greeting, get well message, her photograph in the paper with the Signing Choir.

During this Phase Melissa expanded her texts, tried different formats and continued to demonstrate her independent literacy learning. She was confident and attempted complex texts. She made her decisions on topics without hesitation. She was ready to write. She continued to use temporary spelling, she edited when she felt it was necessary and did not back away from difficult words. For example her vocabulary included: excursion, Rock and Roll, Disco, cousin, birthday, highway, Mercury, and Signing Choir.

The following literacy related behaviours were observed:

* Melissa started a text and extended it as she went along in session 44(7.4.89). She typed 'WE AR GOETOMACDNOLDS', not satisfied with this she typed again 'WE ARGOETO MACDONALDS SATADAY WEITH KIMANDME AT WORRAOG' (she pronounced slowly exaggerating the syllabic sounds as she added detail). She had trouble spelling WITH, I scaffolded "What does it finish with?" She said "TH" and completed it. With a little help she found the answer.

* Melissa displayed a knowledge of different writing modes:
Cameo 4

In session 44 she announced "There will be a Rock and Roll Disco on Friday - I'm going to advertise that". She typed the first part, centre page, using the cursor to position her text and then the return key to move down to the next line.

ROCLLROLL

DECOONINAPRIL14FIDAY

INTHE 60708090

(ROCK AND ROLL DISCO on in April 14 Friday in the 60 70 80 90-years).

In session 45(14.4.89) she typed a greeting, she spaced out the words like a card and 'signed it - Love your cousin Melissa'

TO JANTHAPPY BTHDAY

LOVE YOUR CARZZTMELISSA

In session 49(25.8.89) she addressed her text 'The trees are beautiful in Australia' to Miss O'Sullivan and signed it 'Love Melissa' using a correspondence format.

THE TREESARA

BEAUTIFULINAUSTRLIA TOMISOSULRVNLOVE MELISSA

She also typed my address in the conventional format with the suburb underneath the address. This behaviour signalled that Melissa was aware of a number of different genres. She was transferring knowledge from other contexts to her writing.

*She dialled a number on the phone and carried on an imaginary conversation with someone about a teacher who had been sick. She said "I hope she's feeling allright", she then typed "Mrs Ja---- IhopeYOURALLRIETH, then deleted the H from the end.
In session 47(2.6.89) Melissa informed me "I am in the Mercury, have you seen it? I am going to write it." She typed without spacing, pronouncing the words as she typed "I am in the Mercury with the Signing Choir." 'IAMINTHEMRAKAYWITHTHE SONINGCIER'. She called over the teacher and read it to her. This was an important event and she wanted a wider audience.

Phase 7, 28 July to November 10, 1989.

During this Phase I observed Melissa five times for periods of twenty to twenty five minutes. During these sessions she composed six coherent texts of six to eleven words and one to two sentences. The topics ranged over: trees, a visit to Nannas, boy eats apple, going to camp.

During this Phase Melissa began to add her name to claim authorship of her texts. She used topics from lessons as a source of text and carried a theme through two sessions. Her spelling was becoming more conventional as she made closer approximations and occasionally copied from environmental print to support her text.

The following literacy related behaviours were observed:
*Two texts about trees were typed, carrying a theme from class into her writing. The first in session 48(28.7.89) told about what they did "Yesterday we talked about trees and we went outside to look at trees." The second one in session 49(25.8.89) almost a month later, was an observation about trees "The trees are beautiful in Australia". Melissa was transferring her learning in class to her texts. This was a new behaviour, she had previously used
texts from class and the library as a source of texts but this was using ideas and reporting about events. This behaviour indicated that she was thinking about lesson topics and absorbing information and storing it for use in other contexts.

*Melissa authored two of her texts in sessions 48(28.7.89), 50 (1.9.89).

Cameo 5
In session 48 she typed her text formatting by using the return key
yestUrDAY
WETOWT
TREESWE     WENT OUTSOIDYES     URDAY
BYMELISSA (ABT)
(She read it "Yesterday we talked about trees we went outside yesturday" she decided she had missed 'about' so she added ABT at the end of the text.)
In session 50(1.9.89) her text read:
WEAERGOINGTOCAMPINOCTOBER TOMITNBYMELISSA (We are going to camp in October to Milton).

Melissa was proclaiming her ownership of the texts and at the same time revealing a number of maturing skills in her writing. She was aware that her text could be read by an audience and she wanted that audience to know who the author was.

- Her spelling was becoming more conventional as her vocabulary of sight words increased
- Her approximations were becoming closer as her strategies developed
- she was using computer functions to format, in the first text it seemed she was setting out as the teacher might have done on the board
• She was attending to the surface text in reading, in session 48 she read her text after it was complete and rectified an omission by adding a word at the end (ABT- about). She did not try to place it in the text, possibly because it may have disturbed her format.
• She was transferring learning in other contexts to her texts.

**Theme 2, Cognitive Strategies**

Melissa used the same strategies as other students have been observed to use. At first she relied on placeholding but as her strategies developed she showed her strengths in composing text and relied very much on her own ideas. As Melissa began to gain control of the letter code her use of cognitive strategies to support her construction of text became more apparent. Later she took control of the process as she learned to relate the letters to the words and the meaning embedded in the text.

**Phase 1**

*In this phase Melissa demonstrated that she was aware that letters signified meaning by placeholding her texts. She showed this in session 6(23.10.86) when she typed a string of random letters which she read out as "Children at camp". This behaviour was the dominant strategy Melissa used in the first three phases of the project. She progressed from using strings of random letters to grouping letters like words, she used single letters to represent single words then began to use beginning letters and letters in the words.*

*She used life experience and prior knowledge to compose text.*

*She knew that pictorial representations could provide a source of text for example in session 6(23.10.86) she drew a house (with help) and named the parts of the drawing as a source of text. This was her first use of the environment.*
Phase 2

During this phase Melissa used representational writing—writing like lines on paper but also continued to placeholder with single letters and beginning letters on the computer. During this phase she began to add more letters to her placeholdering. For example, in session 12(4.6.87) she typed M L for Melissa, KKMK for Kim, BVBT (Brendon and Tony), producing a 'word like' format. Melissa made her first attempts to copy text from my notes and showed the first signs that she was beginning to use the environment when she also copied from the screen. She also showed the first signs of linking sound to letter for spelling when she typed "K for car" in session 12 (4.6.87).

She began to make connections between text and prior knowledge/life experience. For example in session 11(21.5.87) she typed '4' and said "I did four laps". She said "I know how many days in the week and wrote 7 on my notes, then said "7 seven days in the week".

Phase 3

Melissa continued to use placeholdering as her main strategy to represent text. Sometimes she used a single letter to represent a word and sometimes grouped letters to represent words as she composed and read her texts. She used the environment in a limited way, copying from the screen and from my notes.

Melissa was beginning to realise that written words held meaning and could be read. This was illustrated when Melissa wrote a text from memory from a book in session 14(30.7.87) and gave the words her own meaning. This was similar to the behaviour noted by Cambourne & Turbill (1987)
when children were observed to copy from environmental print but interpreted the text to match their own story drawing.

**Phase 4**

Melissa continued to placehold but her use of this strategy diminished as she began to try to approximate words using sound to help her spelling. Her first use of temporary spelling appeared during this phase. She extended her use of the environment to include copying from the board and from word cards and printed matter. Another addition to her strategies was to ask for specific help with her texts. Previously she had insisted "I can do it myself" and used placeholding without attempting to type words. By this stage she had begun to use her strategies to help to construct text. For example in session 27(12.5.88) she copied MONDAY from my print then asked "What does Parliament House begin with" and typed as I told her the letters. This was the first time she had actually typed a readable text. She produced 'MONDAY PARLIAMENT HOUSE QUEEN' it wasn't a complete version of her oral text but it was an important breakthrough. In the same session she asked "What does May begin with?", then completed the rest herself from memory.

*In session 26(5.5.88) she approximated 'LAS' for likes, pronouncing the word slowly with emphasis on the phonemes to help her spelling. She said "I'll write Thursday" and pronounced THRRRRR exaggerating the TH and R sounds and typed 'TTHHHHRrrrrrt'. She also asked for help in session 28(19.5.88) by asking for beginning letters then attempted her own temporary spelling.
* She copied from the board as she worked on getting the date under control in sessions 22(10.3.88), 25(14.4.88), 29(26.5.88), 30(2.6.88), and 32(23.6.88).

**Phase 5**

Melissa continued to use the environment and began to use other sources such as library session materials as well as the board, the screen and cards to copy from. Placeholding had disappeared by this stage. She used temporary spelling and speech for self. She vocalised to direct or organise her texts as she typed. For example in session 35(1.9.88) she said "Can I write April, what does it start with - A ? LL?.. She typed Al then deleted and typed 'BABAPRLL' and said "The baby's born in April". She asked for help when she needed assistance with spelling. During this phase evidence of her use of abstract thought appeared as she linked information from other contexts to her texts and she showed for the first time her thought processes as she decided what to write.

*Temporary spelling was the strategy most used by this stage and was observed in nearly all of the sessions during this phase.

*In session 36(22.9.88) Melissa used a library work sheet as a source of text, transferring experience from a previous lesson and carrying the theme through to reading and writing. On this occasion she did not transfer her text to the computer. She was immersed in the reading process, and re-read, dramatising the text, acting out the part and obviously transferring the language experience to her own text. The topic had obviously caught her imagination and prompted an instance of intertextuality (text to text).
Another example of intertextuality (life to text) was observed in session 35(1.9.88) when Melissa typed 'WALLK 2 DOR' and demonstrated the action of walking to the door. 'WALK' was one of the action words the class had been working on. She demonstrated the action to clarify the meaning of the word. She transferred this learning to her text and acted out the meaning to explain the text.

*In session 40(17.11.88) it seemed that she was making decisions on what to write, thinking it through abstractly. She demonstrated this when I questioned her and she said "It's a hard decision, I'll do - At 12 o'clock we will get our books."

Phase 6

Melissa continued to use phonemic segmentation and temporary spelling as her main strategies to help her construction of text. She continued to use the environment in a limited way, she copied from the board occasionally but she relied more on her own experience for ideas for text than on existing text. She displayed intertextuality as she used information from school events and previous lessons as a source of text.

* The advertisement she composed for the 'Rock and Roll Disco' in session 44(7.4.89) is an example of intertextuality (text to text). Her transfer of this topic to her own text showed she was constructing text using concepts and format from a model seen in another context.

Phase 7

Melissa continued to use the strategies of copying, using the environment, phonemic segmentation, asking for help, and intertextuality that she had
displayed previously. In addition she began to use information from previous lessons to help construct her texts and to report on events, giving an explanation of the lesson topic and how they dealt with it. This was exemplified in the text she constructed in session 48(28.7.89) 'Yesterday we talked about trees. We went outside yesterday '(to look at trees).

*Her temporary spelling was improving and a number of sight words appeared in her texts by this stage making for a more conventional looking product in terms of spelling. Examples of this change were observed in sessions 48(28.7.89), 49(1.9.89), 50(1.9.89) and in session 51(22.9.89) when she was obviously using sight words for most of her text.

Theme 3 Computer Use

Melissa's first approach to the computer was to try to use it as a typewriter, she did not explore the keyboard in the way that some of the other students had done. She did ask questions such as "What is that for?" when I pressed the space bar and observed and copied actions such as pressing the shift key. She used the shift key for some time as a modeled action without having a purpose in mind. She had watched Steven manipulate the shift key. In this way she learned to use the function and eventually she made the connection between using the shift to change the letter case and the need to use capital or small letters. At first she held down the shift key while she typed, then later learned that the caps lock key would hold it down for her. She learned from demonstrations as I showed her some functions when I typed for her and from watching other students. For example she started to use return to go to a new line after watching as I did this after typing the date in preparation for a session. This learning was incorporated into her
activities on the computer, sometimes without particular attention to the use it had. Later as she consolidated her writing skills and realised she could use her computing knowledge to enhance her writing activities she used the functions appropriately. She had been absorbing knowledge and storing it without assigning it a particular use, but when the time came that she had the need of a particular function she had the knowledge and the skill waiting to be used.

**Phase 1**

Melissa typed rows of letters, randomly pressing keys as though typing, using both hands. She held down the shift key as she typed and then let it go alternating between upper and lower case in session 1(19.5.86) and 2(7.8.86). She used the space bar to move text around the screen and mixed up the first two inputs.

*By session 6(21.11.86) she had realised that the caps lock key could be used to hold the shift key.*

*By the end of this phase she began to try to find letters on the keyboard instead of random typing.*

**Phase 2**

In this phase Melissa discovered that she could delete typing and would delete any that "she had finished with". She continued to use the shift and caps lock keys to change case but without specific purpose.
* She asked "What's that for?" as I pressed the space bar between words in session 7(5.3.87). I explained "it's a space to separate words". Melissa then typed 'v' and a space to represent her word for 'fire'.

* She used the space bar to move text and to space between groups of letters in word like formation in sessions 9(30.4.87) and 10(14.5.87).

* She watched the screen to see what happened if she typed with purpose but not when she typed randomly.

* She used the cursor (arrow keys) to move up the screen and deleted some text.

* She was finding letters on the keyboard, searching with purpose for required letters.

**Phase 3**

Melissa began to identify letters on the keyboard and relate to letters on the screen as she attempted to copy from the screen.

* She used cursor moves and the delete key and deleted part of the previous text she had "finished with it"

* She continued to use shift and caps lock keys but it wasn't until Phase 4 that she showed an understanding of the function.

* She used the space bar to separate units of letters and also began to use the return key to move to the next line.

**Phase 4**

Melissa continued to use the space bar, delete, shift/caps lock and return keys but by this stage she was beginning to use them with purpose.
*In session 25(14.4.88) she complained "Oh look my T did'nt come out" when she wanted a capital T for Thursday and took note when I showed her how to get the 'T'. She again noted the purpose in session 29(26.5.88) when she said "I've got to get the dotted i. Have you got one?" She had been using the shift/caps lock function for some time but not for a specific purpose.

*She used return to move down to type the date after typing her text in session 27(12.5.88) and session 30(2.6.88).

*She used space to separate the words she was beginning to copy and attempt to spell.

**Phase 5**

Melissa used spacing correctly as she typed names of class members in session 34(25.8.88) but then apparently forgot it as she concentrated on her construction of text and her spelling in the following sessions.

In this phase she began to use the delete key to edit her text and to ask for information about the computer functions.

* She used the delete key to edit when she corrected errors in sessions 38(27.10.88) 39(10.11.88) and 40(17.11.88).

*She began to ask for information about specific keys. In session 40(17.11.88) she asked "What does that say?" pointing to the control, shift, caps lock and other keys "The ones with writing on them". She wanted to know what it said and what the keys did.
Phase 6

Melissa was using the delete key to make changes and to clear unwanted text by this stage. She used the cursor keys to position her text when she wished to format and the return key to move down to the next line. She began to use the symbol keys. During this phase she typed her name to retrieve her file and the cursor keys to move to the end of her file. She used the shift/caps lock keys purposefully operating them herself as she wished to use them.

*In session 43 she began to type her name with a small m then changed to "Bigger".

*In session 44(7.4.89) she used the cursor (arrow keys) to position her text in the centre of the screen and the return key to move down a line.

*In session 45(14.4.89) Melissa asked how to get the + and = signs. In session 47(2.6.89) she asked "How do you get the plus again?" and "how do you do equals and take away?" She tried them all out after I showed her again.

*In session 47(2.6.89) she typed her name to retrieve her file and moved to the bottom of the file using the cursor arrow key. She also did this on other occasions during this phase and in Phase 7.

Phase 7

Melissa consolidated all of the skills and knowledge she had accumulated during her participation in the project. At this stage she could operate all the computer functions that she needed for her writing. She had also been operating the printing functions with assistance but mainly in the computer room so that it does not appear in the records. During this phase she
operated the printing functions in class, by this stage she was quite familiar with that procedure.

Melissa learned to use the functions of the computer progressively as she improved her writing skills and needed to improve her computing skills. She began to take an interest in the printed products when she began to produce text she could read back in phase 5. At that time she would ask if she could print and would help to produce all the texts at the end of the session. She liked to show the teacher and take them home for her mother. Her mother was keenly interested in her progress.

**Summary**

Melissa was slow in getting started with independent writing, this appeared to be due to her lack of letter recognition/ sound co-ordination and possibly lack of concentration. It wasn't until Phase 4 that she made her first real attempts to type texts. She used placeholding to represent her oral texts which indicated her awareness that letters made up units which signified meaning. During the first three phases her efforts seemed to be concentrated on mastering the letter code. She did not copy much in the early stages. Her first independent typing was of names, her own and her friends. She arrived at the correct typing through a series of approximations starting with one letter and progressing to adding other letters as she distinguished the sound. By April 1988 (Phase 4) she could write her full name and by Phase 5 she could type the names of all class members. The first real breakthrough came in Phase 3 when she wrote TOY SHOP and gave it a
meaning "Tony E-----", this indicated letter recognition and an effort to retrieve meaning. It was not until Phase 4 at the beginning of 1988 that she began to make efforts to type words rather than placeholder. At this stage she also showed the first signs of having sight words in memory when she identified "DAD" as she copied a text rather inaccurately. By the beginning of July 1988 (Phase 5) she was using phonemic segmentation and visual memory to aid her spelling and typing recognisable texts. Her reading progress became evident at about the same time as this change in her writing behaviour, indicating that progress in one was linked with advancement in the other.

From this point on Melissa really took charge of her writing and demonstrated her ability to produce cohesive texts and to think about what she was writing. She used all of the strategies identified by other researchers (Harste, Woodward & Burke, Cambourne & Turbill), as she moved from placeholder to typing formatted texts. Her lack of letter co-ordination in the first stages held her back for a while, but once she overcame that problem her literacy skills proliferated at a good pace. Using the computer was motivating for her, it helped to bring her efforts into focus and to co-ordinate her writing behaviours. She showed when she said "I can do it myself" that she was confident of her own abilities and of her capacity to learn.

Melissa demonstrated that with support and encouragement she could overcome problems. For a child with her disabilities her achievements in literacy at the age of eight were not inconsiderable. Melissa went to an IO
Integration class in a primary school at the beginning of 1990 and continued to make good progress.

I visited the class at the end of 1991. Melissa was using the computer very well, typing very quickly and she was full of enthusiasm about her writing and eager to show her competence on the computer. She typed and edited as she typed text, copying from her written class work directly on to the computer as I watched. She read her text accurately, and edited, she moved some text, corrected some spelling and added a paragraph break. It was a text of 68 words, a letter to a football team from 'you fan Melissa Mo-----.'

The story was in one block but as she typed she edited, she said, "There should be a full stop and a new line". She wasn't quite sure where the break would be and asked me "Should it go here?" I said "Let's read it through again and see what you think". We did this together and she decided where to put the new paragraph and edited the wording from 'you will rugby up league ladder' to 'you will go up the rugby league ladder'. She edited a small i to I and from East to Eastern. She also changed the text to read 'I am a big fan of R. W. She left a small letter and missed a space at the beginning of the new paragraph. However, when I said to her later, "Look to see if there is anything you have missed", she said "Oh have I missed a capital" and corrected that, and when I said "Have you missed anything else? " Melissa inserted the space. She also re-arranged the last part of the text, moving a phrase in front of her name in the letter format, and made an addition 'you fan.' after her name. She used cursor moves to edit and knew the procedures to print. The teacher was very pleased with Melissa's progress and said she thought that the computer helped all the students in the class.
CASE STUDY 5

Ricky

Ricky joined the class in 1986, he was then seven years old. He came from a non-Anglo background and had speech and language difficulties. He had been recommended for Special Placement in June 1984 and had been in another class at the school until 1986. Diagnostic instruments Merrill Palmer, administered 21.2.83, Hiskey Nebraska, 20.7.83 had indicated that Ricky was functioning below his chronological age level. The Chicago Early Assessment administered in June 1984, indicated that he was functioning in the mild to moderate range of intellectual handicap (part of school records). There was no given reason for his problems. At the time of entry records indicated that he was awkward in movement, had motor problems, and his speech was limited to a few words. Ricky had a mild articulation disorder, severe expressive and receptive language delay, poor eye contact and social skills. A speech therapy program was undertaken.

Ricky's language problems were very obvious, his speech was disjointed, he often employed single words and gestures without full sentence structure. The fact that he came from a non English speaking background may have compounded his language difficulties. He was inquisitive in his approach to the computer and explored the keys carefully, watching the screen to see what happened. He peered very closely at the screen, I thought he may have been close sighted but on the other hand he may have been trying to see into the screen. In his first session he held the keys down until he realised it was not necessary and was very deliberate in his selection of keys. He did have
minor motor control problems, this was sometimes evident as he hit more than one key as he typed. For example in session 5(11.3.86) he typed 'LIBGGGHT6HOJSE' as he copied lighthouse. Close examination of this reveals that in typing G he accidentally typed B and held the key down to produce BGGG, he hit the T6 keys together and J instead of U. Without these motor errors his copying would have been accurate. He learned to cope with this by deliberate selection of separate keys. He used the cursor (arrow) keys and the delete key from his first introduction to the computer. He watched the changes in the screen headings and pointed to them to indicate he noticed the changes, he was not very articulate. Ricky always had toy cars in his pockets and these were a source of communication. He showed them to me and I examined them, talked about the colour and the different models and how many he had, how fast the real cars were. He responded to this interest and we established a comfortable and co-operative relationship.

The data which was used to construct Ricky's case study was collected from 17 February, 1986 to 3rd December, 1987. It came from a total of thirty four sessions of approximately twenty minutes during which I observed Ricky and engaged him in conversation as he composed text using a computer as a writing tool. He moved into a senior class in 1988, I did see him on a few occasions after that and these sessions have been added to the data.

Theme 1 Literacy Development

Phase 1, 17 February to 2 June, 1986

In this period I observed Ricky on ten occasions for sessions ranging from fifteen to twenty minutes. During these sessions he composed two coherent
sentences and nine two word texts of related words which did not form a sentence but represented his attempts to communicate. The topics of his sentences were: daddy's car, and apple (prompted by the apple logo on the computer). The other texts were: black eyes, two cars, three trucks, yellow bike, school bus, beach lighthouse, black cat, red car.

During his first session on the computer Ricky attempted to type his name and produced 'rcy'. He pointed to the apple logo and said "Apple" and typed 'apl', this appeared to be spelling from the sound of the word. He explored the keyboard carefully and told me words he wanted to write. I printed "Cat, doggy, and Peter" on my notes. He then copied from my print fairly accurately (one extra y), he needed help to find 'p and t' but the other letters he found himself. He used the space bar between words (as he had seen other students do) and arrow keys to move the cursor across the screen. He then told me "Daddy black car", I prompted "Daddy has a black car" he confirmed this and typed 'dady' without any assistance, then asked for help "black car". I helped him by pointing out letters for 'black car', he typed his original text of 'Daddy black car'.

From this first session it was obvious that Ricky knew letters and sounds and could find some of them on the keyboard. He demonstrated this by copying from print and typing 'apl' from the sound of the word. He did not seem to have much difficulty recognising most letters, he mistook F for E on one occasion, he often used 'O for D' and sometimes 'D for O', and occasionally 'M for W' or 'W for M' because of similarity of form.
During phase one Ricky demonstrated a number of coping strategies he had begun to employ as he tried to make sense of his world.

Firstly, he was placeholdering, initially with random letters then progressing to using letters in the words he was trying to represent, then groups of letters approximating the length of the words.

Secondly, he copied from my print after he supplied text orally.

Thirdly, he copied from print in the environment as a source of text.

The following literacy related behaviours were observed:
*He demonstrated that he was aware of the function of capital letters in session 5(11.3.86) when he typed 'Ll Ii' after I typed LIGHTHOUSE in upper and lower case. It was again evident in session 6(18.3.86) when he attempted to type his name then pointed to it and said "big" and wanted to change from small letters.
*Ricky gained control of his first name through a series of approximations, at first he represented it with three of the letters then four or more eventually he had all the letters but not in the right sequence. By the end of Phase 1 he recognised his name and read it from the screen and by August in Phase 2 he could type his name correctly. As noted with other students the correct independent typing of his name seemed to be his first autonomous achievement on the computer.

Data collected from these literacy events showed that Ricky had the following literacy related knowledge and skills at this stage in the project:
(i) Knowledge that:

*spoken language could be represented in both pictorial and written form

*his own experience could be recounted in both oral and written language

*written language was made up of various units 'words' 'letters'

*letters had specific names, sounds and shapes associated with them

*letter shapes had two forms (capital and small)

*written language proceeds from left to right

*there are conventions of punctuation, for example in session 7(14.4.86) I had helped him to type a text by pointing out letters. He put a stop at the end of the sentence and then pressed keys for other punctuation marks. When he pressed the stop he said "stop".

(ii) Skill in:

*beginning composing text from experience

*using environmental resources as a source of text

*recognising some letters by name and associated sound in both capital and small forms

*copying text from written form to keyboard.

Ricky made use of resources in the environment from the start.

Firstly, he used icons in the environment as a source of text (he referred to the apple logo on the computer).
Secondly, he looked around the room at posters and named items to write and copied from the computer screen headings in session 7(14.4.86).

Thirdly, he copied from his language work book and copied text from charts.

Fourthly, he copied his full name from his wallet and values from coins (session 10, 2.6.86). Later, his use of existing models of text spread to other sources in the environment and included books, the board and in Phase 3, session 18(30.4.87) he copied print from a model camera, inferring that the 'Made in Hongkong' label said "camera".

**Phase 2, 1 July to 14 November, 1986**

During this phase I observed Ricky on five occasions for periods ranging from fifteen to twenty five minutes. During these sessions he composed six coherent texts ranging from four to eleven words and one to two part sentences. The topics ranged over: What Ricky saw, his interpretation of a poster on autumn leaves, news about weather, I like..., rabbits, party.

During this phase Ricky showed a marked improvement in his sentence structure and consequently in his construction of text. In sessions 11(1.7.86), 12(28.7.86), 13(7.8.86), 14(11.9.86), 15(14.11.86), in this phase and in sessions 16(5.3.87), 17(19.3.87) and 21(4.6.87) in Phase 3, he composed coherent texts from life experience.

The change in his expressive language was evidenced in a number of ways.
Cameo 1

In session 11(1.7.86) he orally composed a text from life experience "Ricky saw a big red truck". He also constructed a text from a poster which showed autumn leaves falling. He read the words he could deduce from the illustration and interpreted what he thought it said. He composed 'They blow windy - leaves fall down orange red green and brown' (trees was inferred in 'they'). This was a very expressive episode for Ricky who often used only two word utterances. He had shown an ability to relate to pictorial images previously when he pointed out the apple on the computer and told me "Fell on his head" - The apple was inferred in this, and he confirmed "apple fell on his head when I questioned him (Session 2, 18.2.86).

These texts showed Ricky had a much better grasp of grammatical construction than he had displayed in Phase 1. Instead of using the primitive, pivotal two word construction I had observed in the early stages of the project, he was now using more formal constructions. It also revealed that his vocabulary included action words which he had previously omitted from most of his texts.

In the second text he used an illustration to construct his text and revealed his prior knowledge that the wind played a part in the kind of scene depicted. He also demonstrated that he could think abstractly in inferring that the leaves were falling and he described the colours directly from the poster.
Goodman (1984, p105), states that "Inference is a general strategy of guessing, on the basis of what is known, what information is needed but is not known." Ricky inferred from what he knew the illustration represented the information that he needed for his text.

During this phase the following literacy related behaviours were observed:
* I first observed editing behaviour in session 12(28.7.86), Ricky typed his name as 'RCIKY'. He knew it was unconventional and deleted and retyped correctly then changed again to 'RCIKY'. In session 19(14.5.87) in Phase 3, he typed 'ricky' then pointed out it should have a big letter and added R 'rickyR'. Editing was also observed in Phase 3, session 21(4.6.87) when he edited the date and his name and changed 'i' to 'l' to correct 'colours'. He showed confident editing in Phase 4 in sessions 24(6.8.87) and 26(3.9.87) when he corrected 'DRIBK' to 'DRINK' and inserted missed spaces.
* He used information from a previous lesson discussion about news that snow had fallen in the nearby mountains as a source of text, showing a transfer from life to text (an instance of intertextuality). He also used a class exercise starting "I like tasting" as a base for text in (sessions 12(28.7.86) and 13(7.8.86). In session14(11.9.86) he again used previous lesson material when he copied words from the board then added text from life experience in other contexts.

During this phase he relied mainly on copying from my written version of his oral text or on help with letters pointed out or spoken for him and copying from environmental print. However, during this phase he also displayed the beginnings of the use of phonemic segmentation when he slowly pronounced 'I get wet in' (with some assistance) and typed that part
of his text from sound. He then needed help with letters for the rest of the
text 'I get wet in the rain'. This behaviour was also observed in Phase 3, in
sessions 17(19.3.87), when he type 'li' for likes then pronounced the word
slowly and added 'k', then he needed assistance to complete. It was again
evident when he pronounced "can tell" and produced 'can tll', and also in
session 21(4.6.87), when he pronounced words to help spelling with some
help.

**Phase 3, 5 March to 4 June, 1987**

During this phase I observed Ricky six times for periods ranging from fifteen
to twenty five minutes. During these sessions he composed six coherent
texts ranging from four to six words and one to two part sentences. The
topics ranged over: the sea, Ricky likes..., Ricky can..., camera, a walk, Ricky
has been sick. His topics all related to himself at this stage but he was giving
information about his likes and his activities so he was constructing text
from his life experience.

The following literacy related behaviours were observed:
*Ricky could type his name correctly by this time but was still placeholding
and approximating other names. He was so confident of his own name by
Phase 4 session 23(23.7.87) that he played around with the letters and typed
'RKCYT' then said "I tricked you". He again jumbled up the letters in session
26(3.9.87) then deleted and typed correctly.
*Ricky made an assumption that printing on a camera actually was
"camera".
Cameo 2

In session 18(30.4.87) he showed me a toy camera he had in his pocket. He had typed his name earlier, and he decided to write "Ricky has a camera". I printed 'HAS A CAMERA', he copied 'HAS A' then checked on the camera itself where there was a very small label, he pointed to this and said "camera" and copied from the label 'made in HDYCDKC(Hongkong)' and said "that says camera" (the printing was very small so he had difficulty with the letters). He added 'CAMRA' after this copying from my print. He was very pleased with this effort.

This event highlighted Ricky's independence, he chose to copy from the camera which indicated he was not dependent on my assistance. He had shown that he could find things for himself. His assumption that the printing actually said 'camera' indicated that he was aware that labels do signify meaning related to the object they are attached to. His final addition referring to my print seemed to be a way of saying I can type that too, but I have my own way of doing it.

*Ricky had first shown interest in the date in Phase 1 session 8(28.4.86) when he informed me "It's Monday" and copied the day underneath the date. During this phase he began to copy the abbreviated date from my notes and the screen, in session 19(14.5.87) he copied on the same line as the date I had typed, and put in the stops, then deleted '87' and replaced it with '19'. In session 21(4.6.87) he carefully moved the cursor with the space bar to place his typing under mine and copied from the screen, correcting when he missed a stop. The same behaviour was observed in session 22(2.7.87) except
that he used semi colons instead of stops. In Phase 4, session 23(23.7.87) he corrected my error and said "It's not the 22nd it's the 23rd", he typed 23;7;87 underneath my typing and asked me to correct mine. He again copied the date underneath mine in session 25(13.8.87). I did not observe Ricky's complete sequence with the date as he moved to another class but on two occasions in 1988 when I saw him he typed a sequence of numbers then the abbreviated date independently (10.3.1988.) and used return to go the next line before typing text.

*In session 21(4.6.87) he composed a two part sentence 'Ricky has been sick' then later added to it 'and is better now'. He showed by this that he was following through with his theme and relating back to his text. He demonstrated the same ability to relate to his text in this same session, he had attempted to type Steven and produced 'STE77Y', then I had typed 'Ricky has been sick', he then copied 'STEVEN' from a wall chart correctly and wanted to place it with his first attempt. I showed him how to move the text and he then added the second part to his other text.

**Phase 4, 2 July to 3 December, 1987**

During this phase I observed Ricky for nine sessions ranging from twenty to twenty five minutes. During these sessions he composed eleven cohesive texts ranging from three to twelve words and one to three sentences. The topics included: friends, trip to MacDonalds, Pizza Hut Party Pack, his pets, his sister, Ricky's turn, Peter is sick, Peter goes camping, Going to see Santa Claus, A Crab -where it lives -who caught it. Ricky also continued to approximate names and to copy from existing models in the environment.
This phase was characterised by a departure from his own centrality as the subject of his texts. He began to look outside himself to what others did and to use his experience to construct texts.

The following literacy related behaviours were observed:
*Ricky copied a lengthy text accurately from a calendar in session 22(2.7.87). He put in spaces, and a stop, the only error was caused by his hitting two keys together (po). He used a capital to start the second sentence but not for the first. This demonstrated his competence in finding letters on the keyboard and in the use of computer functions. He still used 'o for d' but this was a problem of visual similarity on the keyboard, his letter recognition was good and he also knew letter names and sounds.

*Ricky's reading skills had improved, he demonstrated this in sessions 24(6.8.87) and 30(3.12.87).

Cameo 3
In session 24(6.8.87) he told me what was written on the carry bag he had and copied 'pzzaHUTPARTYACK' (Pizza Hut Party Pack). He then pulled out the contents pointed to the illustration of each on the bag and named them, matching each one correctly. He copied from my print 'MASK HAT BALLOON DRINK'. He read it all back from the beginning for me without any trouble. He called the teacher over and read his text from the screen, he needed a prompt for balloon and drink this time but read everything else himself. In session 30(3.12.87) he read the label from the top of a container "Danger live crab". He also read his text of 'REAEN CAR' in session 29(26.11.87), saying to the teacher "Mrs Do.... I wrote racing car' and pointed to his attempt.
Ricky had been showing his ability to find words in the environment for some time, he could recognise names and other familiar words. However, in these events he demonstrated the beginnings of reading for meaning, whereas earlier he had inferred meaning from context. For example when he identified 'made in Hongkong' as "camera". The party pack contents were identified so that he knew what each one was. The container with the crab in it was perhaps partly context assisted but he knew that it said "Danger" (this was on one of their word cards so he would be familiar with it).

Ricky composed text about his pets and family, making a cohesive statement about his home surroundings. He copied these from my printing. He started with his dog "My dog is Fluffy" then "I have a kitten is Bandit", following the trend of thought. He then added "Angelina is my sister" but when he typed this last part he changed it to 'ANGELINA SISTER RICKY'

He also carried through a textual theme when he copied from the label on the top of the crab container then continued to give information about the crab.

Cameo 4

In session 30(3.12.87) he showed the crab to me and copied from the lid 'OANGER LIVE GRAO' (using O for D/B and G for C - the print was fading). He then said "He lives in the Sea" and typed that with some assistance as I told him letters after he started the first letters by pronouncing the words.
He then typed independently 'PETEWR HDGGXN' and pointed to it and said "Peter catched the crab". (Peter was correct except he hit EW together).

This literacy event highlights a great deal about Ricky's literacy at this stage. He could read text and use it as a source for his own text then add to it to form a new text. This indicated he was using abstract thought as he linked what he knew about the crab to help construct his text. He was using the strategies of using print in the environment, copying, asking for help, sound of words to help spelling, placeholding. All of these strategies as noted previously have been observed by researchers studying early writing behaviours in regular classrooms.

**Theme 2: Cognitive Strategies**

As Ricky progressed in his literacy he revealed the processes and strategies that he used as he attempted to gain control of written language and to construct meaning from text.

**Phase 1**

During this phase Ricky demonstrated that:
*He was aware that resources in the environment could provide literacy models. For example, in session 7(14.4.86), he looked at posters around the room and identified a number of items then attempted to type with help and copied from the screen heading. In session 9(29.4.86) he copied text from his language work book, in session 10(2.6.86) he copied from charts and
coins. He copied from existing texts throughout his participation in the project, using a variety of sources in the environment;

*Ricky used placeholder to represent text. For example in sessions 3(25.2.86), 4(3.3.86), 5(11.3.86), 6(18.3.86), 7(14.4.86) he used groups of letters, some with the initial letter of the word and some approximating the length of the word. In session 10(2.6.86) he typed 'FGGHJ' for Flag using the initial and end consonants. In Phase 2, session 11(1.7.86) and in session 14(11.9.86) he used the correct number of letters to placeholder and also placeholder with single letters for a string of words. He progressed to using first and last consonants in sessions 17(19.3.87) and 20(21.5.87) in Phase 3 when he used temporary spelling beginning 'tl' for tell, and 'TGY' for Tony. He continued to placeholder in these ways during the time he participated in the project. In 1988 when I saw him he used temporary spelling 'TR KAWP' for "To Camp", he used W for M still but it was a reasonable independent attempt to spell. He also used 'R' for 'ARE' in session 34(3.3.89) as noted he had left the class by this stage and probably did not have regular time on the computer.

Graves, (1983) argued that "children are able to compose when they know about six consonants". They do this by placeholder words, sometimes with single letters, not necessarily contained in the word. They are not able to retrieve meaning from this. Graves noted five stages of invention moving from Stage I - initial consonant to Stage II - initial and final consonant then to Stage III and Stage IV-inclusion of an interior consonant then to Stage V - a vowel placeholder and finally Stage VI - correct spelling. (pp184-186).

Graves states that by Stage III the child is able to retrieve meaning at a later time. Ricky's behaviour conformed to this to some extent, by the end of the project he could approximate some words from sound and he could spell a
few such as 'CAN, IN, TO' but he had not reached Stage VI- correct spelling
(as proposed by Graves).

**Phase 2**

Ricky continued to use the strategies he had displayed earlier and added
instances of intertextuality to his repertoire. He used ideas from previous
lessons, showing that he was transferring learning from other contexts and
using ideas generated by events with other temporal links. His use of the
environment spread to include posters, word cards, and the board.

*Ricky demonstrated that he connected print on charts to spoken words
when he 'composed' a text' using the illustration to guide his interpretation
of the print 'They blow windy, leaves fall down orange red green and
brown', he was 'reading' the pictorial cues (Session11, 1.7.86). This was an
instance of intertextuality (illustrative information to text). Examples of
another form of intertextuality (life to text) were observed in sessions
12(28.7.86) when he used information from a lesson for his text and session
14(11.9.86) when he used prior knowledge to structure a text he based on a
word from a lesson.

**Phase 3**

During this phase Ricky was still placeholdering and at this stage he was using
a single letter to represent a word, for example in session 16(5.3.87) he typed
'SFCVHY' and vocalised as he typed, "Sea , I go to the sea". He attempted
beginning letters of words and used phonemic segmentation and asked for
help with some letters as he employed a combination of strategies to
construct text. This kind of behaviour was reported by Harste, Woodward & Burke (1984), in their studies of early literacy.

* Ricky demonstrated that he could ask appropriate questions, in session 19(14.5.87), he moved his fingers carefully along the keys, looking for the stop as he copied the date, then asked "Where is stop?"

*During this phase I first observed Ricky's use of phonemic segmentation. In session 17(19.3.87) he typed 'li' to start 'likes' then pronounced slowly and added 'k' then asked for help with letters, he typed 'ca' for cars and asked for help to complete. He typed 'Ricky' pronounced "can tell" slowly, emphasising the phonemic sounds and typed 'can tll' then asked for help to complete his text, 'Ricky can tell the time'. He continued to use phonemic segmentation in session 29(26.11.87) and in 1988 in sessions 32(23.6.88) and 33(18.8.88).

**Phase 4**

During this phase Ricky continued to use the environment as a source of text. His use of resources spread to include: a calendar, books, a party bag from Pizza Hut, Labels and the computer screen. He continue to placeholder at times and to spell using sound to assist his spelling. He was making progress and showed evidence that he was using the same processes and strategies that the other students had displayed.

**Theme 3: Computer Use**

Ricky explored the computer carefully, he watched the screen closely to see what happened and noticed changes in the program headings at the top of
the screen. He was inquisitive about what happened and tried to look into the screen. He counted the four cursor (arrow keys) and compared them with the directional arrow keys at the top of the screen in the program headings and noted they were "the same" symbol. He very quickly found how to use the cursor keys to move around the screen, I observed this behaviour in session 8(28.4.86) when he moved the cursor back and forward and up and down to whatever position he wanted. He found the delete key and discovered he could remove text with it. He remembered the delete key in his second session and carefully deleted everything he had typed that day. He had a minor motor problem and it is apparent in the data that sometimes he hit more than one key even though he might have selected the correct one. He selected keys deliberately and this helped to minimise the effect of this overlap. He found letters on the keyboard without too much difficulty. One of the problems he had was differentiating O and D and he sometimes typed M for W. This was a visual problem, he seemed to know letters and apart from the noted aberrations did not have trouble finding letters once he was accustomed to the keyboard.

**Phase 1**

During his first session on the computer Ricky pointed out the apple logo and typed apl. He used the 'apple' a number of times to start his texts. He noticed the changes in the screen headings and tried to work out what was happening.

*In session 5(11.3.86) Ricky showed evidence that he was associating upper case letters with the keyboard and compared upper and lower case to satisfy himself they were the same. He typed 'Ll' and 'li' using the shift key to
change case after he had observed the way I did it to demonstrate for him. In session 6(18.3.86) he showed that he had retained the knowledge when he typed his name in small letters and said "big" and wanted to correct it. He again noted "it should have big letter" and added capital R at the end of his name which he had typed in lower case in session19(14.5.87) in Phase 3. He used the shift key to change case in session 14(11.9.86) in Phase 2 and continued to use it from this time on and eventually used the caps lock key with it when he discovered it held the shift down.

*He used the space bar to separate words and the delete key to move back if he had moved the cursor too far. He had watched the use of the space bar as I typed text for him and modeled the action.

*In session 7(14.4.86) Ricky put a stop at the end of a typed sentence then pressed other punctuation keys. He used the shift key to get ? after trying and getting/. When he came to the stop he named it "stop". He showed an awareness of the computers function keys and used them from the beginning of his period of participation in the project.

Phase 2

*In session 11(1.7.86) Ricky explored the use of the delete key, the return key and the space bar, checking to see what happened each time he pressed them. He could operate these keys and knew what they did from a process of discovery. He knew how to use the shift key and the caps lock key by this time. His basic learning had been achieved in Phase 1, he added the knowledge of how to move down a line with the return key during this phase.
*In session 14(11.9.86) Ricky used the shift key to keep changing from upper to lower case, he did the same in the next session. He seemed to like to compare the upper and lower case letters. In session 21(4.6.87) he started to type his name in lower case then deleted and used the shift and caps lock keys to change to upper case.

Phase 3

By this stage Ricky was competently using the functions he needed for his writing. He continued trying different keys.

*He began to copy the date during this phase and put in stops or semi colons and used the return key to go to the next line. In session 21(4.6.87) he used the space bar to move down and along to place his typing under my typing showing that he was aware he could move the cursor in a number of ways.

*In session 21(4.6.87) he used the delete key to edit a text but he did not use spaces, he seemed to be concentrating on copying accurately and apparently 'regressed' in his use of spacing. He usually used spacing appropriately.

He typed the question mark at the end of the sentence by using the shift key, showing that he had not forgotten other functions.

Phase 4

Ricky continued to use the skills he had built up during his participation in the computer sessions, he used return, shift, caps lock and delete keys appropriately. He used the space bar most of the time but occasionally missing them when attending to other concerns.
* In session 26(3.9.87) he typed a text 'dogisfluffy' without spacing, then said "Put in space" pointing to the omissions. I showed him how to go back over the letters with the cursor keys without deleting and he inserted the spaces.

* In session 26(3.9.87) Ricky deliberately changed to upper case for his sister's name.

By the end of Phase 2 Ricky had explored the computer and attended to the functions he needed for the purposes of his writing. He did not progress to retrieving and saving his file, the limiting factor here was time spent in the project. From the way that Ricky progressed in using the computer, asking questions when something interested him and finding out for himself, I have no doubt that he would have continued to extend his computing skills given more time.

Summary

Ricky had an expressive and receptive language delay and it was very apparent at the beginning of his time in the project. He improved considerably over the time I observed him and he communicated with me quite well. He was attending speech therapy which would have accounted for a great deal of the improvement, but I think using the computer was also a contributive factor. He was interested, he felt a sense of success, which he displayed when he widened his audience by reading to the teacher, it was particularly evident when he said "Mrs Do---- I wrote racing car".

Evidence that Ricky was proceeding in the same general direction as the other students appeared in the strategies that he used. He knew how to
scrounge literacy models from other sources. From the start he used the environment, exploiting different sources as time went on. He placeheld throughout the period of time but used the other strategies of copying from existing texts and phonemic segmentation to assist spelling. Ricky always showed initiative in looking for topics, he used concrete visible objects as sources of text, such as the apple logo, the Pizza Party Pack and the crab. He also used his own experience and information from previous lessons and other contexts. He could expand his texts from a starting word or phrase and some instances of intertextuality were observed. In these demonstrations I observed clear evidence of his use of abstract thought.

He showed by his treatment of the date that he was also attending to the problem of achieving control and given time I believe he would have come to the same level of conserving the other students displayed.

With encouragement Ricky began to feel confident that he could write and he was demonstrating an improvement in reading. I believe that he would have continued to show improvement in all aspects of his literacy learning in much the same way as the other students observed. However, I did not have as long a period of continuous observation for Ricky, and therefore do not have the same supportive evidence for some of the developments noted with other students. Nevertheless the data is indicative of his conforming to the same general processes outlined in previous case studies.
CASE STUDY 6

Kylee

Kylee was one of the original members of the class when the project commenced in 1985. She was eight years old at that time. She had attended a primary school but had missed a lot of school because of a number of medical problems. She had been recommended for special placement in November, 1983 when she was almost seven years old. Her performance in Diagnostic tests Merrill Palmer administered 17.2.1982 and McCarthy Scales administered 21.11.83. (part of school records) indicated that she was functioning in the upper moderate range of intellectual disability but with verbal abilities at a higher level.

Kylee was friendly, and her social skills were good. She was very interested in the computer. She could recognise her own name and could write her own and her brothers name at the start of the project. The data which was used to construct Kylee's case study was collected from 23 July, 1985 to 14 November, 1986. It came from a total of thirty one sessions of approximately twenty minutes during which I observed Kylee and engaged her in conversation as she composed text using a computer as a writing tool. Kylee moved to a senior class in 1987 and I did not have the opportunity to see her again until 1988 when the teacher of her class agreed that some of the students should return for further observation on a few occasions. This additional data has been included in the analysis.
Theme 1. Literacy Development

Phase 1, 23 July to 29 October, 1985.

During this period I observed Kylee for ten sessions ranging from fifteen to twenty minutes. During these sessions she composed thirteen coherent texts ranging from four to seventeen words and one to two sentences. The topics ranged over: computer, her brother, her daddy, her nanna, TV, her bike, her car, school activity, going to the airport, visiting nanna, the lady next door, a picnic.

A typical session would start with good morning greetings and news about the family. Kylee was very communicative. During the first session on the computer she typed her full name, with one wrong letter in her surname. She left a space between her names after being shown the space bar. (She wrote her name across the printout of the first sessions and again had not quite gained control of her surname.) She then typed her own story (with some help with spoken letters to spell 'today'), she used temporary spelling, and used the space bar appropriately. She then typed the first three letters of her brothers' name and placeholder for other family members.

From this first session it was evident that Kylee knew letter names and sounds and could recognise letters and find them on the keyboard. She could type her first name and approximate her surname. By the end of this phase she could type her full name correctly. She knew that her words could be transferred to the computer and she attempted temporary spelling for
some words and placeholder for others. Her use of the space bar revealed that she knew that words were separate units.

From the beginning of her participation in the project Kylee employed the strategies of placeholdering, asking for help, and temporary spelling. She also showed her ability to compose text from life experience. By the end of July she was typing her name to retrieve her file and beginning to use print in the environment as a source of text. By September there was evidence that she was using sound to help her spelling and she began to copy the date from my notes.

Data collected from the literacy events observed in Phase 1 revealed that Kylee had the following literacy related knowledge and skills at this stage in the project:

(i) Knowledge that:

*spoken language could be represented in both written and pictorial form

*her own experiences could be represented in both oral and written language

*written language was made up of various units 'letter' 'words'

*letter shapes had two forms (capitals and small): (For example, in session 3(13.8.85) she asked how to change to lower case to copy the form from her book, showing she was aware of the difference. Occasionally she used 'i' for 'l' because of similarity on the keyboard but she usually had no difficulty with the keyboard letters.)

*written language proceeds from left to right (she wrote her name across the first printout).

(ii) Skill in:

*orally composing a coherent text about her own experiences
*recognising letters by name and associated sound in both capital and small forms

*accurately copying text from written form to keyboard

*using print in the environment as a source of text construction.

The following literacy related behaviours were observed:

*Kylee started the project with a repertoire of strategies to aid her construction of text. In the early part of Phase 1 she used placeholder but by July she was beginning to use phonemic segmentation and making closer approximations to correct spelling. By August placeholding was no longer a feature of her literacy behaviours.

Cameo 1

In session 1(23.7.85) Kylee typed an informational text 'TODAY I J PUTEW' she told me "Today I got the computer". She asked for help to spell 'Today', she knew 'I' she placed 'Got' with 'J' and approximated 'computer'. She then typed 'JAS' (Jason), 'MUGSDAFF' (Mummy), 'DAC' (Daddy) 'MJHDSA' (Nanny), she verbalised each one as she typed.

In session 2(30.7.85) she typed 'JAZ IL MCXZ/' and said "I'm typing Jason is at school". She then typed 'RTYUI' (My daddy is at work) and "QWWERTYFG HG JHK' saying "My nanna is at home" synchronising the words with the typing.

These episodes revealed the range of strategies Kylee already had at the start of the project. She asked for assistance with spelling, she knew from memory the pronoun 'I' she placed with a single letter for a word, and approximated from word sound. She also placeheld with beginning letters followed by random letter grouping and with an approximate length for words. These coping strategies formed part of the repertoire the other
students developed over time. Kylee had been in the school system longer than the other students, therefore her skills and knowledge were more advanced.

Her placeholder indicated that she was aware that letters could be used to represent words even if the letters were not accurate, but she was at the stage where she was attempting to move to accurate representation. It follows that she was also aware that there is a 'correct' form and she was in process of moving to closer approximations to the conventional form. Graves (1983 pp 184-186) outlines the different stages through which children progress towards correct spelling. Some of these stages are reflected in Kylee's text.

*The strategy of using the sound of words to help spelling was first observed during this phase in session 2(30.7.85) when Kylee typed 'POP' pronouncing slowly after prompting and emphasising phonemic units. This behaviour was also observed in sessions 4(23.9.85), 6(30.9.85), 9(21.10.85) in this phase and in session 16(15.4.86),17(29.4.86), 20(10.6.86) in Phase 2 and continued throughout her participation in the project.

*During this phase Kylee began to use resources in the environment as a source of text. In sessions 3(13.8.85) and 10(29.10.85) she copied from her language workbook. In session 4(23.9.85) she copied from her own typing on the screen to assist with text in process of construction. However it was in Phase 2 that she really expanded her use of environmental print when she copied lengthy texts from her workbook, from books and posters.

*Kylee showed that she could compose text from life experience starting from one word/idea and extend to form coherent structures.
Cameo 2

In session 4 (23.9.85) she told me she had a bike and wanted to type bike. I prompted her "What does it start with?" She typed 'bike' pronouncing slowly to help her spelling. She then typed her name and added 'has abike' she knew the first two words (sight words) and copied bike from her previous typing. She then continued adding more information 'a little red bike'. She pronounced 'little red' slowly and I prompted "two t's" and "e on the end" for little but she completed 'red' herself. She again copied bike from previous work on screen. The end result was 'bike KYLEE has abike a little red bike'.

Kylee revealed in this episode that she had a number of sight words (function words) such as: has, a, and had used 'I' in an earlier text. It was also apparent that she was using sound (phonemic segmentation) to help spelling and the scaffolding I provided when she asked or hesitated when she needed help.

She also revealed that she knew once she had spelled a word she could refer to it on screen and use previous work to support her text. She built her text by adding further information as she thought about her bike, revealing a capacity for abstract thought. She again added additional information to a beginning text when she typed 'I coloured in a motorbike' (with assistance to spell the longer words) then typed underneath 'yit is a big mcgorbike' using sight words, phonemic segmentation to spell 'big' and copying motorbike from the screen. (She wore glasses so the errors may have been visual and motor -g for t , adjacent letters.)
*During this phase I observed Kylee's first attempt to edit in session 5(24.9.85) when she realised she had made an error and used 'i for l' and added the 'l' without deleting the 'i' in her name, 'Kyilee'. In session 10(29.10.85) she corrected by deleting and inserting missed spaces when she copied from her language workbook. She also typed her name incorrectly then typed again correctly directly after the incorrect version. She corrected when she hit a wrong key in session 11(18.2.86) and corrected '01 to 10' when she typed the date in session 20(10.6.86) and 'ISS to IS' in session 21(24.6.86). She continued to use these editing skills throughout her participation in the project.

*Kylee began to type the date, firstly copying from my abbreviated notes, in session 5(24.9.85) she put in the stops after asking where the stop was. She continued to do this in sessions 8(8.10.85), 9(21.10.85) and 10(29.10.85) in this phase and in the early stages of Phase 2. By session 15(24.3.86) in Phase 2, she had added the day and the month 'MONDAY 24MAARCH' with help with spelling. In session 19(3.6.86) she typed '3. JUNE. 1986.' she checked the spelling of June in a folder. In the next session she typed the date independently she spelled June herself and corrected '01' to '10', '10. JUNE. 1986.' In session 21(24.6.86) she typed 'JUN 24 1986.' and only put a stop at the end, by the next session (8.7.86) she had returned to the abbreviated register and typed '8.7.86.' without reference to my notes. It was evident that she related this abbreviated form to the day when she said "Tuesday, my mum plays tennis today, I'll write that."

*Evidence of intertextuality (life to text) was first observed during this phase when Kylee used an activity she had completed in class as the source of an idea for text in session 6(30.9.85). She transferred experience in a different
context to her text on the computer. She also used experience in another
context in session 9(21.10. 85) when she typed a text about the lady next door.
'THE LADY next door has a klock on the wall she has a little boy to visit'

Phase 2, 18 February to 24 June, 1986

During this phase I observed Kylee eleven times for periods of twenty to
twenty five minutes. During these sessions she composed twelve coherent
texts ranging from four to ten words and one to two sentences. The topics
ranged over: Mummy's activities, Dad's activities, cooking, Easter, absence
from school, holiday, her brother, her likes, going to school, visiting a
friend.

This phase was characterised by an increased use of existing literacy models
in the environment. Kylee copied from her language workbook, story books
and posters and from my printed version of her orally composed texts. She
continued to base her texts on her family and herself using a combination of
temporary spelling and sight words. Her sight words by this stage included: I,
TO, IN, GO, ON, BUS, DAD, AM.

The following literacy related behaviours were observed:
*Kylee had been using the return key to go to a new line and experimenting
with the shift key since September of 1985 but had not shown evidence of
purposeful use of these functions. During this phase she began to use them
deliberately. She used return to move down after the date and to separate
topics. This behaviour was observed in all sessions and was particularly
noticeable in sessions 11(18.2.86), 20(10.6.86), in this phase and 23(28.7.86) and
24(18.9.86) in Phase 3 when she had a number of topics all formatted on a new line. Evidence that she was aware of the particular function of capitals was noted in session 15(24.3.86) when she used the shift key to start a sentence with a capital and then reverted to small letters and in session 17 (29.4.86) when she changed to capital to start her name then again went back to small letters.

* During this phase Kylee began to use punctuation. She had previously used stops in the date as she copied but had not used it for punctuation. In session 13(10.3.86) and 14(11.3.86) she copied texts and put in a comma and a stop at the end of the sentences. In session 18(19.5.86) she put a stop at the end of her own text and in session 19(3.6.86) she put stops in the date, between her first and second names and at the end of all sentences she copied from a book. She put stops after all her own texts in sessions 22(8.7.86) and 23(28.7.86) and continued to do so in Phase 3.

*Kylee composed text from life experience and could structure an explanatory phrase. For example in session 16(15.4.86) she typed a text starting with her name, she used temporary spelling, pronouncing the words slowly to help her spelling. She produced 'mumda iws awa' then used return to go to the next line and added an explanation 'doktu sad i wos sik' (Monday I was away (the) doctor said I was sick). She asked for help with the first two letters of 'doctor ' and 'said' but the rest was her own temporary spelling.

*Kylee's developing strategies were evident in the way she used various means to help structure her texts.
Cameo 3

In session 20(10.6.86) she typed the date, correcting without deleting '01 10 JUNE. 1986. She used return to go to the next line and typed 'KYLEE IS MY NAM ILIK FOOD" pronouncing slowly to spell 'name, like, and food' (I helped with 'Y in my and two O's in food', She used return twice to leave a space and typed 'I GO TO SCHOOL ON BUS' (sight words). She again used return and typed 'DAD GOS TO WAK IN CAH' (Dad goes to work in car). She verbalised this slowly with emphasis on phonemic units as she typed to help her spelling but did not ask for assistance. She went to the next line and typed 'I WENT TO JUDITH AL...' she asked for help for E in WENT but used phonemic segmentation too then asked for help after typing the beginning letters of unfamiliar names.

In this episode Kylee displayed editing behaviour, the use of return to format her texts, phonemic segmentation to aid her spelling and asked for assistance. One text was completed from visual memory. Kylee's literacy skills were not dependent on one line of support, she had a number of strategies she used to help to structure her texts. These texts were separate compositions but they did have a linking theme of providing information about Kylee and her activities, her family and friends.

Phase 3, 8 July to 14 November, 1986

During this phase I observed Kylee five times for periods of twenty to twenty five minutes. During these sessions she composed eleven coherent texts of two to 18 words and one to three sentences. The topics covered: Mum's activities, truck crash, new boy on the bus, going to the airport,
information about Mark and his family, her computer, her teacher, riding her bike, visitors.

During this phase Kylee's texts became more expansive and less focused on herself. Some were still concerning herself but other people and their activities also became a focus of interest. She composed her most comprehensive text about Mark and his family, carrying the theme through three sentences. She reported an incident directly from life experience of seeing a crashed truck on the road. A new boy on the school bus also became a topic for her to write about. This departure from her own concerns signalled a move away from the centrality she had displayed earlier.

The following literacy related behaviours were observed:

*Kylee used punctuation, consistently putting a stop at the end of her sentences during this phase.

*By the end of July her sentence structure was much more complete. Previously she had often left out words; in session 20(10.6.86) three of her sentences had words left out, for example 'I GO TO SCHOOL ON (THE) BUS.'
In session 23 (28.7.86) Kylee said "Dad and Jason went to the airport, we went to MacDonalds, I better write that." She typed 'DAD JASON MACDNAS WE MET DAD AND JASON AT THE AIRPORT'. She used temporary spelling for MacDonalds, I helped her to spell 'airport', she pronounced "MET" slowly and spelled from sound, the rest she knew from visual memory. She went to a new line and typed 'MARK WENT TO MRS BU.... CLASS', she asked for help to spell Mrs Bu.... but the rest she knew without help. She continued on the same line, 'A NEW BABY FOR MARK'S FAMILY. MCHALE DEAN ASLEEPINHS BASKET'. She asked for help to spell 'baby' and 'family', I printed BABY and we pronounced FAMILY together, she typed 'FAM' from sound and I prompted the ending. I showed her how to put the apostrophe in. I printed the last sentence and she copied that, except for 'ASLEEP' which she pronounced slowly and spelled from sound. She then went to a new line and typed 'I HAVE A COMPUTER.' Again she used return to go the next line and typed 'I SAW MY WRS TH........'. I printed HAVE and COMPUTER when she asked how to spell them. The last sentence I also printed, she mistook W for M.

These texts clearly showed the improvement in her sentence structure. The three sentences about Mark's family were clearly one whole text, she kept them together whilst all the others were separated by the use of the return key to go to the next line. She used punctuation for each sentence indicating that she knew the conventional structure. Kylee was still using all her
known strategies to support her texts. In this one episode she had a wide range of topics which reported interesting events in her world. She was using life experience as the source of her texts and deliberately thinking of topics to write about.

* She continued to use text in the environment as a source of text and followed the format of the book in session 26(14.11.86) when she copied a text about a circus ringmaster. (Her copying was not always accurate, she did wear glasses and I believe this contributed to copying errors.) She was aware of the conventions of format and demonstrated on this occasion that she could follow the format laid down in the model she was using.

I saw Kylee again on five occasions in 1988, over a year after she had moved to another class. On the first occasion (10.3.88) she typed the date 1omaj 10.3.88 then tried again 10 Ma and asked me how to spell March, then completed 10 March 1988. She typed two texts, the first 'kyle murebnp (placeholding Bermagui) I went on holiday torwasdf grandma went to BERMAGUI'. She spelled out 'holiday' herself and asked me to spell 'Grandma and Bermagui'. She then typed 'MA SPTEWSPD MY FRIEND TYUIIO CAME TO MY BROTHERS HOUSE KYLEMU' She asked for help to spell 'friend and brothers house'. She then wrote on paper and copied 'THEMAMED THE HEATR TDADAT THE HE HORSE' (The Mermaid Theatre Tuesday The He Horse). On subsequent occasions she typed names, placeheld and typed disjointed texts for example 'BICKRE JASON' (Jason rides a bike), 'SLEEP MICHAL' (Michael sleeps) 'NAN KYLEE' (Kylee is going to Nannas) 'JASON STAHT OM MUM DAD GO OT' (Jason stays at home by himself, mum and dad go out). It seemed that she was further behind in her text construction than when I had last seen her in 1986. She
seemed more tentative and asked if she could write the date in session 29(2.6.88). She typed 'Ja' then deleted and said "I think it is June 2nd 1988" and typed 'jun 2 988' (she had previously typed dates such as this correctly). She then asked "Can I write my cousins name?" I am not certain what had happened to cause this change. Perhaps her access to the school computers, was limited, or there may have been a difference in class organisation which resulted in a less independent approach to writing than in the class I was working with. It was also possible that she may have had further medical problems which interrupted her schooling.

Theme 2: Cognitive Strategies

Phase 1

From the start of the project Kylee showed evidence of a number of strategies she used in her construction of text. In this phase she demonstrated:

* She could ask appropriate questions, for example in session 5(24.9.85) she asked where the stop was when she was copying the date. She asked for assistance "How do you spell... ? What's next?" when she needed help with spelling.

* She used life experience and prior knowledge to compose text.

* She knew how to scrounge literacy models in the environment, for example she copied text from her language workbook.

* In the early stages of this phase she placeholder words but by the end of September she seemed to have moved away from that and made recognisable attempts to approximate words.
She used the strategy of pronouncing some words slowly, emphasising phonemic units and obviously used sound to help her spelling. This behaviour was observed in sessions 2(30.7.85), 4(23.9.85), 6(30.9.85), and 9(21.10.85) in this phase and throughout the time she participated in the project.

She used temporary spelling.

Evidence that she transferred experience from other contexts was observed in session 6(30.9.85) when Kylee used a class exercise 'I coloured in a motorbike' then added a descriptive text 'It is a big motorbike'. She obviously differentiated between types of motorbikes. Other instances of intertextuality (life to text) were observed in sessions 9(21.10.85) and session 21(24.6.86) in Phase 2 when she talked about cracker night then copied text from a poster in the classroom.

**Phase 2**

During this phase Kylee expanded her use of the environment, she copied from her language workbook, story books, an information folder for the date, and posters. She continued to use the strategies observed in Phase 1 (except for placeholder), copying, asking for help, phonemic segmentation, temporary spelling, and approximation. These were the kinds of behaviours previously mentioned, and observed by other researchers in regular classrooms.

Kylee asked for confirmation as she typed asking "Is that the letter" but continued to make her own attempt at temporary spelling, for example in session 16(15.4.86) she asked for help with the beginning letters of 'doctor'
and 'said' but typed the rest of her text herself, even though she checked by asking if the letters were right.

* She continued to pronounce words to help her spelling, verbalising her texts as she typed.

*She used 'speech for self' as she organised what she would write. For example in session 17(29.4.86) she said "Nan is going away on holiday and Pop, I'm going to write about that,". In Phase 2 session 22(8.7.86) she told me "My mum plays tennis today. I'll write that."

**Phase 3**

It was evident in this phase that Kylee had begun to look for topics to write about outside of her own immediate experience. She demonstrated that she could think about events which were distant from her own personal concerns when she moved from the centrality she had displayed earlier. She continued to use the strategies she had employed in Phase 2 and her texts became more informative as her skills improved and her literacy knowledge expanded.

*She showed that she related information to events in other contexts in session 22(8.7.86) when she typed the date (8.7.86), then said "My mum plays tennis today" and typed 'TUSDAY MY MUM GOS TO TENIS'. The day was not recorded in the date she typed but she obviously linked the date with the day and with her mothers schedule.

*She showed interest in other people as sources of text when she composed texts about 'a new boy' in session 22(8.7.86) and Mark and his family in session 23(28.7.86).
She demonstrated that her vocabulary of sight words was increasing and therefore that she was retaining information from a range of sources and contexts. For example in sessions 20(10.6.86), 22(8.7.86) and 23(28.7.86) she typed words from memory such as: SCHOOL, ON, BUS, BOY, DAD, MY, MUM, IS, TO, WE, AT, THE, AND, WENT, NEW, FOR, IN. These, and other words were now in her repertoire of sight words, she had progressed from the few function words to include nouns, verbs, and adjectives. This allowed her to structure her texts more formally. For example 'MARK WENT TO MRS BU---- CLASS'.

She also had the knowledge of where to look, or the strategies to use if she did not know a word from memory. She asked for assistance when she needed it but showed her independence by trying to spell in her own way.

Kylee demonstrated her independent learning when she used the computer functions to format her texts.

She also demonstrated independent learning and her ability to conserve in the way she changed the way she recorded the date over a period of time. She showed that she had grasped the concept that the date represented the day, the month and the year. By this stage she could type the date independently and in different registers. This evidenced the fact that she was retaining the information across formats and thus was conserving the meaning of the different representations of the date.

**Theme 3- Computer Use**

Kylee was very interested and keen to use the computer. From the start she coped well with finding letters. She consistently used the space bar after being shown once, and deleted to correct when she made errors after finding
the delete key removed text herself. By August 1985 she retrieved her file by typing her name, following instructions and continued to do this throughout her participation in the project. Over time she learned the functions of the shift and return keys and used them appropriately.

Phase 1.
*From the first session Kylee used the space bar after observing my demonstration.
* The delete key was used to correct errors in typing wrong keys as she went along and later to correct errors in spelling and missed spaces.
*In session 3(13.8.85) she used the shift key to change to small letters to conform to the text she was copying from her book. She had observed the use of the shift key by other students and myself and tried it out herself during this session. In session 4(23.9.85) she continued to use it appropriately for capitals to start her name. She changed to lower case after using a capital to start her name and then back to capitals to begin 'Nann' and again for her own name. In session 5(24.9.85) and in subsequent sessions she consistently used a capital to start sentences. On two occasions in Phase 2 and one in Phase 3 she departed from this practice.
*In session 5(24.9.85) she asked where the stop was as she copied the date and from that time on she used the stop for the date. She first put a stop at the end of a sentence when she copied a text in October.
* She began to use the return key to format text by the end of Phase 1. For example in session10(29.10.85) she typed her copied text on the same line as the date but used return to go to the next line to type her name and her brothers name, then used return again to go to the next line to type her address.
Phase 2

Kylee began to use punctuation as she copied. In Phase 2, she put a comma in one text after looking along the keyboard and asking "is it that?" She added a stop at the end of the sentence in session 13(10.3.86). By May, 1986 she was putting stops at the end of her own sentences and continued to do this to the end of her time in the project.

* She continued to use the return key and separated her topics in this way for the remainder of her time in the project except for one occasion at the beginning of Phase 3, session 22(8.7.86). In session 26(14.11.86) she used return to conform to the format of a book she was copying.

Phase 3

By this stage Kylee had familiarised herself with the keyboard and with the functions she needed for the purposes of her writing. She had not progressed to saving and printing independently before she left the class but she had shown the same kinds of 'learning by doing' as the other students. She explored the keyboard as she required a particular key, function or symbol and she used the strategy of asking when she needed a specific function or symbol if she could not find it. Her exploration and discovery of the capacities of the computer was mainly concentrated in Phase 1. Additional knowledge and skills were apparent in Phase 2 when she began put her knowledge to use. For example the use of the shift key, the functions such as return, and punctuation to formalise her texts.
By the end of her period of participation in the project Kylee could use the computer confidently for the purpose of writing. Support was available if she needed it and she was aware of that. As stated previously it was not my intention to teach the use of the computer as a skill, but to observe the student's use of the computer for writing.

Summary

Kylee also used the strategies observed by Cambourne & Turbill (1987), Graves (1983), Calkins (1981, 1983), Harste, Woodward & Burke (1984) and others previously mentioned. When Kylee entered the project she already had an established repertoire of strategies to aid her construction of text. She used placeholder but also attempted temporary spelling from the start of her participation in the project. She soon replaced the strategy of placeholder with other strategies using phonemic segmentation and scaffolding: assistance from researcher, use of the environment and copying. She demonstrated her knowledge that her own experience could be represented in both oral and written language.

Kylee did not utilise the environment to the same extent as some of the other students, relying a great deal on family anecdotes as a source of text. She always had an idea for text and could link experience in other contexts to her writing, using life experience as her main source of text. She did show evidence of extending her topic sources when other students and people other than family members began to appear in her texts. She became quite proficient in the use of the computer and always showed interest in the products. She liked to print and show her efforts to an audience, the teacher, her family and peers.
Kylee moved to a senior class in 1987, therefore her records cover a period of one and a half years. The observations I made in that time revealed that she was following the same developmental trends observed in the other case studies. Her writing of the date, evidence of increased vocabulary, use of support strategies, expansion of composed texts and increasing confidence in her writing was congruent with the behaviours observed in the other case studies. However, as noted there seemed to be a change on the few later occasions that I saw Kylee. She seemed to be less independent. There could be a number of reasons, she had not been a regular participant for some time and she may have needed more time to re-orient herself. There was insufficient data to make any inferences about this apparent reversal of her previous confident approach to writing.
CHAPTER 5

WHAT DOES THE DATA TELL?

Bruner argued that the stance and beliefs of the observer must unavoidably shape his view of events when he cited Einstein's argument:

the world, externally considered, could never be autonomous from the framework of the beholder. (Bruner, J.S., 1983, pp 66,67)

This analysis is no different in that the 'framework of the beholder' inevitably influences the views presented.

The purpose of this chapter is to identify the observed trends and commonalities in the behaviours of the students as they composed text using a computer as a writing tool.

Close observation of student interactions in the writing process provided the major data source for this study. The evidence from many studies indicates that the computer is highly motivating for children, and intellectually disabled children are no different in this. For them too, the computer is motivating and attention holding. The attention-holding factor is of prime importance in providing the opportunity for observation of behaviours and student interaction with the computer.

The case studies presented in the previous chapter reveal a great deal about the processes of literacy learning and learning per se of the informants in
this study. Not only have they demonstrated the ways in which they dealt
with the problems of learning to write and read, they have also shown the
way they dealt with the need to acquire skills and knowledge to use the
computer. For the most part this was peripheral to the intended purpose of
examining the use of the computer as a tool for writing and its effect on
literacy learning. It was however, a significant component of the 'whole
story' that the data revealed. In their success in coping with computer
functions they revealed just how they learned and that they learned what
they needed as they needed it for the purposes of their writing. A picture
emerged of 'what they did and how they did it' reflecting their progress in
reading and writing and the interrelated process of understanding how to
use of the computer.

This chapter will endeavour to draw together the information that has
emerged from the case studies.

Evidence of a series of developmental trends which revealed the informants
learning progression appeared in each case study. Individual variations are
apparent but the overview points to the informants' literacy learning
development following a path which could be discerned as a 'general
model' for the group. The commonalities which emerged in the behaviours
observed showed a progression which raises the possibility of a set of
general principles concerning the way these students cope with literacy
learning. These trends were manifested in the way the students:

• used the print resources of the environment
• learned to write the date
• progressed in reading skills
• developed composing strategies.
Using the Print Resources of the Environment

Each student made use of the resources of the environment as a support for spelling, as a source of text, and as a source of ideas for text.

Michelle made use of the environment from the start, firstly by using her own drawings from the language work book as a source of text and later copied the texts from her book. Mark also used his drawings and their captions as a source of text. Kylee made use of her language workbook as a source of text as well as books and posters.

Melissa and Steven did not seem to follow this pattern so rigidly, they did not use their language books but they both used illustrated sheets from library sessions and other class work as sources of text. They did use the resource of word cards, names and class information on charts and names on desks. (It may be that at the time Melissa and Steven joined the class there was more emphasis on independent writing and a wider range of writing activities, which were not centred on the language workbook.) Towards the end of the project Steven used his written work from previous 'process' writing lessons and class texts on the board as a source of text. Melissa did not seem make so much use of the environment as the other students, however, she did refer to the board and charts often without actually copying from them. She had a fairly extensive vocabulary and seemed to jump straight from placeholding to constructing texts from her own experience. She did refer to environmental sources for assistance with spelling but not usually as a source of ideas.
Ricky made use of a range of materials and print in the environment, firstly he noted the apple logo on the computer and used it as the source of an idea for text. He named items on posters, copied text from charts and from his language workbook, books, my notes, and the board as the other students had done. He also used a range of other environmental sources to support his construction of text. For example, the contents of his pockets (cars, coins, wallet, camera), contents of a party pack carry bag, the computer screen headings, an observation specimen crab. Ricky examined his surroundings and selected items of interest that he could write about.

All of the students made use of materials in the environment to support text in process, to provide existing models of text and as ideas for text. They used information on charts, posters, the board, books, labels, my notes, the computer screen, in fact they exploited any print or resources in the environment which provided a literacy model or other support for their writing.

A range of different ways of using the print resources of the environment emerged, which included:

**As a source of text - using existing models**

Michelle and Mark both made use of drawings and texts from their language workbooks to provide sources of text. Melissa decided to 'write about a house' she drew a house (with help) and used the drawing to construct a text by naming the parts. Steven made considerable use of the word cards available in class. Kylee copied from texts in her language workbook, from books and posters. Ricky copied from his language workbook, books, and charts and his name in his wallet.
Looking for print to aid spelling and text in process - self directed

All of the students checked spelling on the board, on charts, on the screen and sometimes in books as they composed text. They did this particularly when typing the date, or names, and when using words from lessons in their texts. Ricky used the label on a camera to aid his text, inferring that the print on the label was the word he was looking for. Kylee looked in a folder to help her spelling of 'June' in the date.

Searching specifically for required word in a number of sources

Mark searched long and determinedly for the word 'Play' in a number of books. Melissa checked for particular words on the board, 'Girl, jump, beautiful' to support her texts. Michelle looked around the room for a poster to find the word 'Easter' when she typed a text on the subject and searched the screen for her dog's name, she knew where to look for information. Steven demonstrated this behaviour when he searched for specific words amongst the word cards.

Looking for ideas for topics - focus on word or theme and use to start text

Michelle and Mark both used existing texts as a starting point for their own texts, adding to them and giving them a different character. For example, Michelle turned a straightforward statement on the board "It is a sunny day" into a text expressing her own feelings about rainy days. Mark used a topic from a book to structure his own text on the same topic. Mark used words from posters and from existing texts on the screen then extended them with new information to form new texts. One strategy I observed Michelle using
was to select a focus word or phrase and build text around it. Steven used existing texts from other lessons and typed additional words and sentences to add to the text. Melissa copied parts of a text from another lesson to form a different text, extracting only the words she wanted. Ricky employed this strategy quite often in his use of charts and materials in the environment; identifying words on charts, inferring the print on a poster, using the apple logo, his party pack materials, the label on the crab specimen jar, the contents of his pockets and words on the board.

**Linking with Experience to Prompt Text**

Michelle and Mark showed evidence of this when they linked print in the environment to their personal experience and used the ideas generated for new text. For example, Michelle's linking of her experience with the Tall Ships to posters in the classroom; and Mark's use of a winter topic in a book to link with his experience of winter, which both resulted in the generation of new texts. Other examples were the text Michelle produced 'I like the rainy day' prompted by copying from a text on the board and Mark's text about Panda's which linked his experience at the zoo with the poster in the classroom. Ricky linked his knowledge about the crab and where it came from to the specimen he examined and started his text with the label, but completed the text with information from his own experience.

The way the students used the environment evolved over time and became more sophisticated as their needs changed. The earlier modes did not disappear, rather, new behaviours were added which enriched the texts
derived from their more complex interaction with the resources available in their surroundings.

<table>
<thead>
<tr>
<th>Developmental Trend 1</th>
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<tbody>
<tr>
<td>The first observations of the use of environmental print were generally the use of existing models of text as sources of text.</td>
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<tr>
<td>Subsequently environmental print became an aid to spelling words singly and in texts in process. Concurrent with this behaviour they developed the strategy of looking for specific words in the environment to support the structuring of texts.</td>
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<tr>
<td>Eventually the more sophisticated technique of looking for ideas for texts in illustrations and other sources such as books was observed.</td>
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Another behaviour adopted by Michelle, Mark, and Steven was to copy words from a number of areas of the environment without constructing a story line. This may have been for spelling purposes or as an alternative to constructing text. In Steven's case I believe it was a preliminary to text construction. It seems reasonable to assert that the students moved towards a more protean approach to the use of environmental resources by building on their experience with text and linking this experience with knowledge gained in other contexts. The more they used the strategy of looking for support in the environment the more cognitive links they made and the
more experienced they became in exploiting the print in the environment for their own purposes.

Parkes (1990 p. 31) expresses ...a view of text as potential. Meaning is not seen as residing wholly in the print or in illustrations but is created through interaction which involves the reader's past experiences in life and language...

Parkes' comments could well be applied to the students reading in the environment to support their texts. In particular Ricky's interpretation of a poster reinforces this view of text.

What clearly emerged in the case studies was the importance of available demonstrations of print in the environment. The students referred to charts and wall posters as sources of text, to support text in process of construction and for ideas for text. What was particularly noticeable was that they selected those that could be linked to previous units and lessons or their own experience and constructed their own texts using the background knowledge they had already acquired in other contexts. A number of them referred to the wall print which the teacher had around the room containing information about the students. There was one wall print made up of an illustration of a train with photographs of the class members pasted in the carriages, another one with information about their names, birthdays, addresses. These were used by a number of students.

My observations of the informants' use of the environment reinforced my conviction that availability of printed or illustrative material that is meaningful for the learner is a major factor in early literacy. Print around the room and ideas gleaned from illustrative material was a generative factor in the writing achievements of the participants in this project. The implications for the classroom are clear, print and illustrative material
around the room, which is relevant to classwork and of interest to the students personally is a valuable aid to language learning. The class teachers used this strategy well during the time I was engaged in the project. Material relevant to lessons was always in evidence. Charts created by the students and the teacher which related to their activities featured regularly. These were changed as different events occurred and the class interests changed.

**Learning to Write the Date**

Writing the date is a real world "whole" reading/writing activity and presents a microcosm of other real world reading/writing tasks. It has a purpose - giving information; an audience - the reader; a value - providing factual data; it is a genre in its own right, encompassing a number of registers. It can therefore be used to illuminate the learning of other related genre and it follows that some generalisations can be made from examination of the processes these students employed as they learned to write the date.

To accomplish the task of writing the date, the students needed to know what the date represented in terms of content and to know the purpose of writing the date. They needed information about the day, the month, the year and how to present that information in a written format. They also needed to be able to extract that information themselves from different forms of representation (registers). In other words they needed to know the different registers that they might encounter. These included the abbreviated date I used myself (1.2.87), or as changed by some students (1.2.1987), the intermediate registers (7 March 1987/ March 10 1987) the full date (Thursday, 10th March, 1987).
All of the students exhibited a keen interest in the date and in getting the information in the date 'right'. This may have been due to the morning class ritual which included putting the date on the board and sometimes making comment about the weather or the class program. They also noted the recording of the date on my notes. The progression the students followed in their efforts to gain control of the date was very noticeable and showed a general trend. The students made a concerted effort to "do the date" and it became accepted practice to start a session by recording the date. A range of different ways of coping with the task of writing the date emerged, these included:

**Copying**

Mark and Michelle began by copying the abbreviated date from my notes, they progressed from that through a series of intermediate steps to copying the full date from the board. One of the steps towards this was evident as they copied the abbreviated version from my notes and then began to inform me what the day was and to copy that from my print. Mark had added the additional information of the day to the abbreviated date by the end of the first phase and Michelle had done so by the end of the second phase.

By the beginning of Phase 3, Michelle was typing the date as '29 JULY 1986' and checking the spelling of July on the board but typing the rest independently. By July, 1986 (Phase 3) Mark was copying the abbreviated date but adding the day and the month from the board.
Steven began by typing the day and then the month in full, copying from the board. By Phase 2 he accepted the abbreviated date and in Phase 3 showed that he could relate to the different forms. Melissa's first attempt to represent the date came in Phase 3 when she copied the abbreviated date 3987 from my typing on the screen when she said "Today is the third of the ninth 87". She turned her attention to copying the date in full from the board during Phase 4. Ricky had first shown evidence of awareness of the date in Phase 1 when he informed me it was "Monday" and copied the day underneath the date. He began to copy the abbreviated date from my notes or the screen in Phase 3, he used stops or semi colons and mostly placed the text underneath mine without deleting it. In Phase 4 he corrected an error I had made by telling me "It's not the 22nd it's the 23rd" which indicated he was using knowledge he had internalised. He knew the date and was no longer copying my version. The use of punctuation marks was variable, sometimes they put in stops or commas when they copied my format or the one on the board, but not always. Sometimes they used spaces to separate the elements and sometimes omitted them. This seemed to be an expendable part of the operation, the correctness of the information was the main concern.

Relating elements to day/month/year

Students began this process by making comments about the day, identifying it from the board or class information and saying perhaps "It's Tuesday today, I'll write that". The next stage was an attempt to make the information about the month and the year explicit. Mark and Michelle both showed this progression clearly. Steven, did not seem to relate to the short
form I used at first and did not accept '5' as representing May or 6 as June. For example in Phase 1, Steven insisted on '4 june 1987', he said "It's June" and deleted the 4.6.87 rejecting the '6' in the abbreviated date and copied the fuller version from the board. It was during Phase 2 that Melissa also insisted "It's the 4th of June" and rejected the abbreviated 4.6.87. They were associating with the format of the date on the board and at that stage could not reconcile the two.

Melissa's first independent attempt was to tell me "Today is Thursday" as she typed 71(17) and placeholder letters for Thursday. Melissa later related to the day as she demonstrated when she told me "Yes it's 5 today, then the 6th tomorrow then the 7th". She also showed that she related to the month and conserved the information across formats on 2nd June 1988, (Phase 4) when she read the previous week's date of 26.5.88. and admonished me "It's not the 26th it's the 2nd Mrs Cook, why did you put 26? and its June not May." Ricky's first attempt also was to type the day, relating it to the date.

**Questioning**

Some of the students questioned the format of the date and would delete and replace with their own version as they related to different ways of representing the date. Over time they all came to accept that there were different registers (ways of representing) the date and that they all conveyed the same information and it was permissible to use any of these registers. Steven corrected errors in my recording of the date, showing that he attended to my behaviours as he read from my notes (he used them as a source of information on more than one occasion). Ricky also corrected an
error and Melissa noted what she thought was an error although she was at
the time referring to the previous week's date. All this showed clearly that
they regarded the date as an important part of their writing.

Moving to other registers

The abbreviated date was often used as a beginning point and then
elaborated with the addition of the day, or the month in full. Eventually this
led to the use of the full date. Michelle said "It's 7th May 1987" and typed '7
may 1987' and checked the spelling of May on the board after completing it
herself. By the end of the second phase Mark could type the date
independently as MAY 201986. Melissa used a variety of forms ranging from
the abbreviated form, to just the day and a number, to the full information
of day, month, date, year. She also made the transition from copying to
independent attempts as for example when she typed ' '21MAY9881'. Steven
moved from full representation to abbreviated then to acceptance of both.
At one stage when he had ceased copying and was attempting his own
expression, he typed only the year.

Relating to other contexts

Michelle used information on the board as a source of text when she said
"Today is Tuesday 3rd June" but typed the abbreviated version of 3.6.86.,
then related the day to the computer sessions. Other students also made this
kind of connection when they related the day to the lessons they would
have. Melissa made particularly clear reference to other contexts when she
wrote dates of future events such as birthdays and a Rock and Roll disco.
Determining

Often students began a session by announcing the date, sometimes they would argue against it if they thought it was incorrect. For example, when an error was detected (Steven did this) or they thought that the representation was not of the day or the month as both Melissa and Steven demonstrated. This behaviour indicated they thought about the date and what it represented and their expectation was that it should be true. They did not accept the date unless they perceived it to be a true representation of the information required.

Conserving by using different registers

Finally, most of the students began to transfer or conserve meaning across changes in format in the date. The date could be typed in one register and read out in different registers as the students came to realise that each different format represented the same information. When they reached that stage, they used the registers interchangeably. By March 1987 (Phase 4), Mark could type the date independently in either long or short form. He had progressed from copying and using external support for spelling to conserving the information and being able to express it in a variety of forms. In Phase 2, Michelle demonstrated that she was not conserving when she interpreted 20.5.86 as "Tuesday 5th of May". However, by Phase 3, she was showing evidence of conserving, and in Phase 5, it was clearly the case when she typed the abbreviated date but read it out as "Today is the 23rd of June."

By Phase 4, Melissa too showed that she was conserving across formats but she had not quite reached the stage where she could type it competently.
without support. Steven showed evidence that he was conserving across formats by Phase 3 but he was still copying at that stage. He showed some signs of apparent regression from that when he copied '19.5.88, then said it's not the fifth and deleted '5.88" and typed 1988 to replace it. This change marked the transition from copying to attempting to type the date himself but by Phase 5 he had overcome his uncertainties and was conserving as he showed when he typed '5may 1989' and added the day to complete the information. Kylee had reached the stage of conserving by Phase 3 of her program as she demonstrated in session 22(8.7.86) when she typed the abbreviated register of the date and related it to the day "Tuesday".

It can be seen from the above summary that by Phase 4 in their respective programs each of the students was conserving meaning across formats when typing the date. They were able to retrieve information from whatever mode the date was presented to them. This conservation is comparable to the conservation of meaning which is achieved with control of passive voice. For example 'John hit Jenny' has the same effective meaning as "Jenny was hit by John' but the meaning has transferred across from active to passive voice. I believe that control of the date was an important achievement and the students certainly regarded it as a goal to be achieved. I did not suggest to them that they must do it, I recorded the date on my notes as a necessary procedure. They observed this, and of course the teacher always placed some emphasis on recording the date on the board; the students engaged with this convention and decided they had to do it. As Melissa said "I've got to do Thursday" and typed 'THURSBAY26MAY' when she looked at the abbreviated form I had typed. (At that time she was
still in the transition period between copying and independent typing and was not conserving.)

The way the students dealt with the task of controlling the date followed a generally recognisable sequence from initial copying to final conservation.

Developmental Trend 2

Initially students copied the abbreviated date from my notes or the screen.

The next progression was to add the day to explicate the information - generally copied from the board at first then typed independently later.

The month and the year were then added in full - with some variation of order, again copied from the board at first then gradually independent attempts were noted.

A period of a mixed approach, partly copied and partly independent typing occurred at the same time a fluctuation between full and abbreviated registers was observed, sometimes a combination format was used.

Finally a balance was achieved when either register would be used confidently and all registers were recognised as carrying the same information - conservation was the observed outcome for the majority of the students.
Progression in Reading Behaviours

A general trend was observed in reading, this generally began with identification of single words in the environment, familiar names were the markers first recognised. This was evidenced as the students began to read and copy their own names from my notes and pick out their own and friends names from the screen as they moved to the bottom of the text files. Single words in the environment which might be assisted by illustrative cues provided the focus next identified, as the students selected words they needed for their texts. Their recognition of the word they were looking for indicated that either from memory, visual or contextual cues they were able to identify the word or words they wanted even though they could not spell them. Sometimes the students asked "What does that say?" as they copied something unfamiliar.

The interpretation of environmental print was a supportive feature for all of the students. Books were also used as sources of text and whilst they were copying from the books they were also reading the text they were typing. Their writing and reading were mutually supportive and improvement in one was generally paralleled by progression in the other. The next development was reading back their work from the screen after they completed a text, often calling over the teacher to demonstrate their achievements to her. An important breakthrough came when they began to read back previous texts, retrieving meaning that had been constructed in the previous weeks. This confirmed their engagement with their texts, and the visual representation that they could re-interpret at this stage. It could only be the visual image on the screen that triggered recognition.
Frank Smith argues that because there are so many variables attached to the different sounds of the English language that knowledge of letters and letter sound relationships does not always help the beginning reader.

I am not saying that the letters of the alphabet are not related to the sounds of speech, or even that knowledge of these correspondences is not helpful in reading. But this knowledge, even if a beginning reader could painfully acquire it all, will rarely permit the sounding out of visually unfamiliar words with sufficient precision to make them recognizable as known words in English speech. (Smith, 1982, p. 146)

Although these students did use the sound of speech, exaggerating phonemic units to help their spelling, they rarely tried to use them when reading their texts, they relied more on visual memory. They would sometimes try the beginning letters and deduce the word from that and from memory of the context of the text if there were words they were unsure of. Progression in reading also emerged as a 'moveable feast', evidencing variation between students. The contexts which revealed the changes in reading aptitude included:

**Single word - names - sight word**
All of the students displayed this behaviour. Gaining control of names, their own and their friends was the first independent reading/writing achievement noted. The next development was recognition of single words as they accrued a vocabulary of sight words which they could read and write from memory.

**Reading from book and other environmental print**
The students combined reading limited text in the environment with construction of text. Reading from books was generally a preliminary to
copying from the existing models in the book although Mark and Michelle both used books in more constructive ways. Mark to provide an idea for a new text after copying the existing one and Michelle to construct text from illustrations.

**Words linked to other contexts/concepts**

The use of materials in the environment as sources of ideas provided links to experience in other contexts. For example when Michelle linked posters illustrating the Tall Ships to her own experience of seeing the ships in Sydney Harbour. Melissa used an idea from previous experience to construct a text to advertise a Disco. Mark demonstrated such links in his text about Pandas and Steven's text about visiting another school showed his ability to transfer from experience to text. Ricky's use of the the apple logo and crab specimen label showed he linked these sources to other contexts and experiences.

**Reading text composed in session- self - teacher**

All of the students displayed this behaviour at some time. Most of the students read their work for me all the time with or without my prompting it, or informed me what they would write in advance. Calling the teacher over to read their work was a fairly common occurrence once they had begun to type and read their texts.

**Reading from earlier sessions**

This was a later development and signalled fairly competent reading of the texts they produced.
Developmental Trend 3

Reading familiar names and single sight words.

Reading from books and charts using known words and pictorial cues.

Reading their own texts to myself then the teacher during the session.

Reading from print in the environment, from books and from previous work.

The Composing Process

The students composing was initially oral, generally in the form of news from life experience. Sometimes in the early stages some encouragement or prompting was needed for some students to help them to get started but usually they would decide what they would write. At a later stage the students would announce "I'm going to write about...." and eventually some of the students typed directly on the computer and read their text to me afterwards.

Orally

The students would often start the composing process by telling me their news and then say "I'll write that". At other times they would simply talk and start to type, deciding as they went along what they would write.
With oral rehearsal
The students would verbalise their intended text before typing.

Without oral rehearsal directly on the computer
Students would type a text and then read it afterwards.

The products: placeholding-temporary spelling - approximation

Placeholding was a beginning feature of first attempts to write of a number of the students. Michelle and Mark did not seem to employ this strategy, (Mark did on one occasion almost at the end of his participation in the project). They both moved from copying to temporary spelling and approximation. Melissa and Steven on the other hand relied mainly on placeholding in the first stages of their participation. It seemed that it was their only means of expression at that time because they lacked letter recognition/correspondence skills. They both knew letters but had not completely mastered their differentiation. Ricky and Kylee both used placeholding strategies, temporary spelling and approximations concurrently.

The students would copy from my printed version of their story or placeholder or attempt temporary spelling or use a combination of all of these. They all eventually used the strategy of phonemic segmentation and it was obvious that visual memory also played a part in their efforts to spell. The progression from temporary spelling to closer approximations was a feature of all the students literacy behaviours.
Developmental Trend 4

Placeholding - Oral composing

Placeholding was used by most of the students, this followed a progression itself. Firstly, groups of random letters were used without any correspondence to the text they represented. Single letters to represent a word, were also used, again without any correspondence to the words. Later the initial letter of the word would be used then initial and final letters then an interior letter until eventually an approximation of words was achieved. Groups of letters approximating the length of words was another form of representation used by some students.

Temporary Spelling - with oral rehearsal

Temporary spelling was a feature of all the students texts, it was arrived at in a number of ways: from visual memory, from sound of the word through phonemic segmentation, from vocalising the text and from thinking about the text without oral rehearsal.

Approximation - without oral rehearsal

Closer approximations of spelling were the result of the use of the strategies of phonemic segmentation, visual memory recall, and rehearsal of words which meant increased familiarity with the word.

Linking with experiences in other contexts

Michelle and Mark showed very clear evidence of linkage with events and knowledge from other settings and previous lessons. They both used
themes from lessons and returned to them more than once. Melissa and Steven also used experience in other lessons and transferred the knowledge to their texts. Ricky too, used ideas from previous lessons. The influence from previous lessons was also apparent in the common subjects the students used for example, weather, fireworks, colours, news items and Easter were featured across case study texts. Another commonly recurring facet of the writing was the students personal experiences reflected in their texts. This was an expected outcome of the free writing approach. It was a feature of the project that the students should write about the things they knew and which interested them. Their topics were of their own choosing.

**Literacy Transactions**

At the conclusion of the study, each student had demonstrated that they were active learners. Each literacy transaction was a step taken towards building a framework of reference for future transactions. Each student had revealed this in the learning contexts discussed above. In the microcosm of their 'learning to write the date' a general picture can be seen which epitomises their learning contexts in a general way.

The interactive aspects of all stages and all learning contexts was evident throughout the project and an overlap between literacy and computer related skills was also apparent at all times. In the first stage, first steps were tentative, they were at the beginning of learning to write, so they used known models and the scaffolding provided by the researcher and the setting. In the date -copying an existing model; in the use of environmental text -copying existing texts "A text can be a picture, a conversation, a piece of
music, a drama, a piece of writing" (Siegal, 1984, cited in Parkes, 1990 p31); in reading, familiar (known) names and words; in composing - an oral text, which they had control of. A self oriented centrality of topics was typical in the first stage. (The term 'stage' is used here to delineate temporal events and differences in behaviour which indicated learning had occurred but not to define set stages of learning as such.)

All of these first steps have a common link, they rely on the known aspects and existing models of literacy. The next steps were exploratory, trying out new knowledge. In the date, notice was taken of alternative methods, information was taken from the board and used to clarify the abbreviated register formerly used. In the environment, the use of a wider range of sources to support text in process was observed - particular words were sought. In reading, attempts were made to infer meaning from contextual cues as well as from known words. In composing they began to use strategies to help their construction of text (support in the environment - sound of words - asking for help). In short, in the second stage of all the learning contexts they were expanding their frames of reference. This was a transition stage and as such, some individual variations were inevitable.

In the third stage they were beginning to get control of some aspects of their learning. They were moving towards a more confident approach to writing. In the date; a combination of different registers, either copied or independently typed led to conservation across registers. In using environmental texts; ideas for texts were sought as well as support for specific needs. A more creative approach to the resources available became apparent. Confidence in reading from previous work from print in the
environment and to a wider audience evidenced an improved reading ability for all the students. In composing, texts became more complex and coherent, a wider range of topics became apparent and a range of supports and combination of strategies was used to construct text.

Although these learning contexts have been discussed separately it is impossible in reality to separate them. They are all intermingled and mutually supportive and in the final analysis must be considered as a 'whole' system. Overlying this system is the additional factor of the use of the computer as a tool to support their writing. I believe it contributed to their progress in literacy learning by facilitating the mechanics of the process of writing. It provided access to conventional letter forms without the effort of manual letter formation and changes to text could be easily executed. It provided motivation to write due to these factors. Using the computer was interesting and I am sure generated a sense of achievement for these students when they could display their efforts on the screen and produce a printed text. The interview data from parents, teachers and principals confirmed these perceptions.

Figure 4 traces the interaction of these developmental trends. The flow of the trend in each case begins with the known aspects; copying the date, copying from existing texts, and reading familiar words. A progression then occurs as the date has specific elements added, and more imaginative use is made of existing models in the environment. In reading, meaning is inferred from context as well as from familiar words, illustrations also provide cues for meaning. As control of different areas occurs, the students move forward to consolidate learning or re-iterate until control occurs.
The Themes and Commonalities which emerged enable a general statement of what these students did in their literacy learning.
A Grounded Theory of the Relationship Between the Use of the Computer as a Writing Tool and the Contexts of Learning which Characterise the Literacy Environment of Intellectually Disabled Students

The use of the computer as an aid to literacy learning for intellectually disabled students is a 'learning context' in itself but it needs to be embedded in the classroom ethos and the language environment of the students. From the beginning the learner engages in the experience, taking an active role in exploring the computer and in finding the way to use it for his/her own text constructing endeavours. Initially the teacher/researcher/peer provide demonstrations of processes and encourage participation. Initially the learners' responses and engagement are subject to their desire to gain control of the technology and the need to make personal sense of the experience. The intention to express meaning in text and to use the computer for this purpose flows directly from this.

Each literacy event within the total language environment provides the potential for a framework for future literacy experiences. The learners' prior knowledge and experience and purpose at the time determines the extent to which the learner attends to the various aspects of any language encounter. With each language encounter, the learner develops and adds strategies for making meaning both in constructing and in reconstructing text. Learning to read and write are inextricably linked, the two processes inform and support each other. Reading and writing are socially learned; interaction with the environment and with others helps the learner to create new understanding (knowledge) from observation or experience.
While still attending to the demonstrations and scaffolding of the teacher/researcher/peer, the learner moves towards more independent approaches to writing. Decisions become the learners' decisions, he/she moves towards ownership of texts, editing occurs, (learning from errors), texts are enhanced and knowledge of where to look and what to look for in the environment is gained through experience. Through the experience of writing with the computer the intellectually disabled learner learns and is provided with a learning environment which is supportive and motivating. The intellectually disabled learner develops strategies to support his/her construction of text which is congruent with the learning strategies of non-disabled literacy learners.
CHAPTER 6

RESEARCH CONCLUSIONS AND IMPLICATIONS FOR THE USE OF COMPUTERS FOR LITERACY LEARNING WITH INTELLECTUALLY DISABLED STUDENTS

No hypothesis emerges from the facts themselves. The human mind has to 'invent' it. Thus abduction is an inner mental process, resulting when one is successful - *in an imaginative leap*. (Saran, in Burgess, 1985, p. 228)

Introduction

The research questions concerning intellectually disabled learners and the use of the computer for literacy learning which guided this study are listed and conclusions regarding the outcomes of the study are presented.

i. What is the potential for the use of computer technology in literacy education for mildly/moderately intellectually disabled learners?

ii. What is the relationship between student motivation to attend to and explore literacy concepts/skills and computer technology?

iii. How does the learning disabled students' skill and knowledge in writing develop when computer technology is used in the class setting?

iv. What is the potential role of computer technology in the literacy acquisition of learning disabled students?
v. What is the range and nature of coping strategies learning disabled students use in a whole language setting?

This study has examined both theoretically and in the learning context the implications of computer use in the language environment of intellectually disabled students. The major conclusions which emerged from the analysis and interpretation of the data and the literature move that:
• The social environment is important, support from teacher, researcher, peers and more experienced learners at home and in school helps to develop literacy environments which encourage active involvement in the learning process. It confirms that the intellectually disabled learner uses the same cognitive strategies for literacy learning as their non-disabled peers.
• A picture emerges of learners who are active meaning makers; who develop their literacy skills by participation in literacy events, through interaction with experienced language users and development of strategies to support their text construction, and by exploration of the computer.
• By exploiting the resources of the environment and their own prior knowledge they show their awareness of the linkages between contexts and their literacy encounters. The focus of all strategies is meaning making, whether in reading or writing.
• The interdependence of all language areas is apparent in the way they seek support from the spoken word, written text, illustrations, experience, and from other contexts of language use. It is important to note that significant trends were evident in the data analysis which allow the proposal of the generalisations in the grounded theory.
•A holistic approach to literacy learning, a learning by doing (as advocated by Graves and others) leads to engagement in literacy events, awareness of print and over time the learners generate their own strategies to inform and support their construction of text.

**Literacy Learning and the Use of the Computer**

Literacy learning is a social process, learned as part of a complex interactive, exploratory and transactive experience. An interactive process entered into by the learner with more experienced others, the cultural environment and resources in the environment. The learners cognitive resources link with demonstrations of literacy functions and forms provided by others and the resources of the environment to promote learning. Reading and writing are inextricably linked, the two processes inform and support each other. The recognition that representational meaning in print can be unlocked in the reading process, realising that "Writing is to be read" (Cambourne & Turbill, 1987) is a major breakthrough in the literacy process.

Halliday points out that narrative develops first as a strategy for learning and it is only when the 'ideational potential comes to be combined with the imaginative function that fictional narrative is born'. Narrative was largely used by the informants in this study, they wrote about personal events, family, school events, they explored the environment and wrote about what was known in the environment. There have been occasions when imagination has entered into the writing and some students ventured beyond factual information however, most of the writing pertained to things they were familiar with and could relate to. Halliday talks of the child constructing reality from interaction with the environment in learning
about their world (Halliday, 1975). These students interacted with the environment and drew from it informational text to construct their literary reality.

Using the computer as a writing tool can be an important facet of the language environment when embedded in the ethos of the classroom. The use of the computer for writing helps to overcome motor problems but more importantly provides a non-threatening and manageable facility for writing. Errors can be corrected easily. Learning by doing allowed the students to go at their own pace. The keyboard helps associate letters with words, the need to locate letters keeps the internalised image intact thus helping to cement letter recognition for beginning writers. These advantages are readily apparent, what is less visible is the effect of these changes to the language environment.

Carrucan (1991, p238), concluded that:

The word processor can be used to improve children's writing but that improvement is as dependent on the ethos of the classroom and the language environment of the child writer, as on the technical capacities of the word processing program.

The point here is that when the computer is a part of the whole, and is integrated in the total language environment it is then a powerful influence on learning. Equally, the language environment and the classroom ethos have a powerful influence on learning. The computer used in this way can be more than just a tool for writing it can become a part of the whole learning environment. It is necessary for the computer to be and be seen to be a part of the whole interdependent learning site. If there is empathy between the elements then the learning environment will be conducive to learning.
The response of the school principal to an interview question "Do you think the computer will be a benefit or disadvantage in literacy learning" was that he could only perceive two disadvantages:

1. If false expectations are aroused and if students are pushed beyond their capabilities by being expected to fulfil those expectations.
2. The use of poor programs.

However, the advantages he had observed were 'sometimes startling' for some students who displayed abilities to persist with programs and maintain attention. 'Some students provided surprises in their tenacity in responding so well to the computer. Some who were not expected to achieve much showed very clearly that they could do many things which previously would not have been expected of them.' He observed that 'The development of skills and advances in learning and greatly increased motivation to learn is very evident...' The advantages gained in 'process writing' have been particularly pleasing, students are stimulated by using the computer for writing.' Similar responses were given by teachers and parents interviewed providing support for the view that the computer was an asset in the language environment of the classroom.

Fig. 5. serves to illustrate the ways in which the computer fitted into the language environment and how the students perceived its function in relation to their writing. The composing process is represented in the right hand section of the diagram whilst the utility of the computer which contributed to the composing process is on the left hand side of the diagram. The interactive nature of the students use of the computer is evident in the data presented above.
Computer used as a writing tool in the class environment

Access to print and immediate results on screen

Freedom from limitations of lack of motor skills

Communication through print

Strategies developing

Production of written work

Approximation

Reading back from work - sharing with others/parents/teacher

Leading to

Improvement in literacy learning motivation and self esteem

Fig. 5. Computer Use for Literacy Learning
Role of the Computer and Motivation in Literacy Learning

• Is literacy learning facilitated by the use of the computer?

The answer from teachers, parents, principals and the students themselves through their demonstrations is 'yes'.

The computer is a powerful tool which provides motivation, the means to write clearly and allows interaction between learner/teacher peers. Errors can be fixed, formats can be adjusted and the end products are publishable, allowing access to a wider audience.

Cochran-Smith (1991,p 147), states:

...there is little information about beginning writers, roughly ages 5 -10, who participate in formal literacy instruction in elementary school classrooms...Beginning writers are involved in the process of becoming literate. When they write, they often have concerns about issues of production-remembering letter shapes, forming them properly, aligning them correctly on the page, locating them in the proper direction, leaving adequate amounts of space, erasing errors, spelling correctly, fixing mistakes, inserting omitted words and lines, remembering proper punctuation, and so on. Because some of these are problems that word processing automatically manages, word processing has potential to be a particularly useful writing tool for this age group.

It must be born in mind though that word processors will not teach children to write and "does not make the process of writing any easier, but it does break it up into manageable chunks which permits writing skills to develop in an integrated manner rather than in isolation." (Crozier, 1986, p103.) Computers are, a valuable aid as a writing tool a fact clearly demonstrated by the participants in this study who remained interested in using the computer for writing throughout the period of their participation in the project.
To illustrate the positive outcomes of this study, in discussions with two of the parents of children who had moved into primary school environments it was evident that each of them attributed their child’s improved learning in part to using the computer. They indicated that they considered participation in the project had really given an educational advantage to their children and had helped them to make better progress than would otherwise have been the case.

**Parent Perceptions**

Parent 1

Mark was transferred to an OA (Opportunity A) class in a primary school in 1988. In a recent follow-up discussion with Marks’ mother she informed me that he had maintained steady progress through years 4, 5 and 6 and had received a special award at the end of year 5 as first in the class. There was a short period of adjustment at first, when he moved into the primary school but the transition was fairly smooth and was helped by having familiar people around him. He would be going to the IM class (students in the mild range of disability) in a High School in 1992. She felt that the time spent during the years of the project using the computer had been a great help to him, that the interest it gave him encouraged him greatly and had provided an "instrument" he liked to use. She said "He loves the computer". He uses the computer at school and writes, prints and brings home his stories. He does not have a computer at home but they intend to get one as soon as possible. He does some writing at home but prefers to write at school on the computer and print his work.
The teacher, when I spoke to her confirmed that he had continued to make progress. A recommendation for placement in a mainstream class in high school had been made. However, Mark still has some social problems in dealing with other students and at times exhibits a reluctance to speak although his speech is now of a good standard. His behaviour is good, maths is progressing but abstract concepts are still a problem. His knowledge of the computer is good and a change in his level of comprehension of reading has been helped by the use of computer programs. His reading was quite good, he could read the words, but his comprehension was not always clear, (he was attending to surface structure and not reading for meaning). Recent computer programs he likes to use require that he understands what is happening so that he can progress to the end of the program. This need to understand has resulted in an improvement in his comprehension, he has been forced to attend to meaning to satisfy his desire to use the computer. The teacher said "He excels in things he is interested in."

Parent 2.

Melissa was transferred to an IO special class in a primary school in 1990 and is to be moved into the IM class in 1992 (The IM class is for students in the 'mild' range of intellectual disability while the IO class is for students in the 'moderate' range of disability). In a recent discussion with her mother I learned that she had progressed very well, particularly in her reading and her spelling had improved greatly. In earlier informal interviews with her mother, she said she felt that using the computer was helping Melissa and that she was very keen and interested. She had a computer at home because her parents felt that it would help her writing. Melissa's mother expressed
her conviction that the use of the computer had made a great difference to Melissa's progress.

**Development of Knowledge and Skill in Writing when Using the Computer**

A number of studies have provided evidence that using the computer for writing does encourage engagement in literacy processes.

Kahn, (1988) ...explored the experiences of second-and-third grade emergent writers as they learned to write with word processing over a two year period. She found an important interactive relationship between the ways children practiced writing with the tool of word processing and the theories they seemed to have about the nature of the activity of writing itself... At the same time, word processing made it possible for young writers to follow through on their evolving theories of writing because adding on to, inserting into, and deleting from initial texts was easy to accomplish. Shifts in emerging writers' theories of writing were not the result of simply using the tool of word processing, however. Rather, the adults who worked with them and changes that developed in the structure of their learning opportunities played critical roles in the process as well. (cited in Cochran-Smith, 1991 p 136).

The data presented in this study supports the argument that the use of the computer in the context of the classroom and the social interactions with more experienced language users is a major factor in the learning process. Transfer of learning (generalisation) was evident in the way the students effected transactions from one context to another as they used the computer as a writing tool. There is evidence from many studies that young children do transpose knowledge gained in one language process to help solve problems in other processes. Certainly children do 'write' and adopt the conventions of writing using knowledge gained from other sources. The influence of the social/cultural context which is apparent in the literature
was borne out in the behaviours observed during the course of the study. Environmental print and social interaction with others served to inform and support the students in their learning to be literate. The importance of the social context is apparent in the data presented.

**Coping Strategies**

The coping strategies employed by the participants in this study in their literacy learning were undeniably the same as those observed in regular classrooms with non-disabled children. The strategies and behaviours observed by Graves (1983), Calkins (1983), Harste, Woodward & Burke (1984), Cambourne & Turbill (1957) and others are echoed in the observations recorded in this study as children's writing was observed in the classroom. The participants in this study proved themselves to be active learners as they took control of their writing, developing their repertoire of strategies to support their construction of text. The sociocultural influence was apparent as they interacted with more experienced language users in the classroom setting. They exploited the environment, using any support that their knowledge of ways of scrounging literacy models from other sources could provide. They showed in their progress that they were formulating their own hypotheses and modifying them as they moved towards more conventional spelling and grammatical structures. Many of the examples documented showed students producing closer approximations of spelling as their encounters with print and spoken language progressed.
Educational Considerations

Jacka, (1984), suggests that though some teachers are dedicated to a particular ideology, many draw inspiration from a number of philosophical tenets, he maintains that there is "no one "right" philosophy or psychological theory of educational practice. What should be right is the relationship between the three." (Jacka, 1984, p31)

It is generally accepted that the goal of education should be to help the child to a full realisation of his/her potential. If the teacher can achieve a balance between providing motivation, encouragement and guidance without stifling independent learning then that goal should be attainable for all students, including those labelled 'learning disabled'. The teacher should be "sensitive to and skilled in the identification of these potentialities, and be capable of fostering them, once identified." (Jacka, 1984, p 30)

There is an intimate correspondence between teaching and learning, the teacher motivates, organises the environment, provides appropriate materials and learning opportunities. Ideally, the teacher provides scaffolding at the appropriate time (by monitoring development and assessing needs) but encourages independence in learning activity at all times.

Learning is the province of the learner, but there is a need for motivation to learn.

...the educator should never allow his or her active and curious presence to transform learners' presences into shadows of the educators presence. Neither can the educator be the shadow of the learner. The educator has to stimulate learners to live a critically conscious presence in the pedagogical and historical process. (Freire & Macedo, 1987, p140)
The students who participated in this study demonstrated that with scaffolding provided at the appropriate time they could achieve more than they would have done alone. At the same time they demonstrated that the experience of achieving with help led to engagement with the process of achievement and to eventually developing the process as part of their own repertoire of behaviours.

What emerges clearly from this study is that a learning environment that encourages active participation of learners and interaction among learners and teachers is vital to support academic development. The importance of social interaction is apparent in all aspects of this study; in literacy development, the use of the computer, and the motivation to engage in learning.

Implications for Literacy Learning for Learning Disabled Students

In order to support literacy learning, teachers need to have sound theoretical understandings of literacy learning and literacy learners. All of the evidence in the data collected over an extended period of time, (which I suggest is imperative for significant learning trends to be identified), indicated that with encouragement and support these students could operate at a reasonably independent level in their literacy learning. They were not simply 'passive learners' as children with intellectual difficulties are often portrayed. They were active learners, participating in the learning experience. They used the same strategies (identified by other researchers) as children in regular classrooms, at a different rate, admittedly, but nevertheless they used them in the same way. The use of the computer,
I believe helped relate writing to reading and facilitated literacy learning by allowing the review of text and retrieval of meaning from previous work. The students participating in this study did not reach the stage of fully drafting and editing but the beginnings of these processes were evident in some of the work.

Intellectually disabled learners should be encouraged to extend to the limits of their potential to learn; to develop their cognitive abilities to the outer limits of their 'zone of proximal development'. Only by doing this can they reach their maximum educational level. They must be encouraged to take responsibility for their learning, not be offered the disincentive of teacher organised and managed 'writing tasks'.

The classroom observations carried out during this study were assisted by the concepts drawn from the literature. The links with Vygotsky's work on language/thought and generalisation became evident in the events described in the case histories. It fitted well with the processes observed to operate in a language environment based on a holistic philosophy and in the conjunction of the use of the computer for literacy learning.

The Need To Provide Appropriate Contexts for Learning

The importance of social interaction in the literacy learning process has been illustrated and discussed in earlier chapters. It is argued that moderate/mildly intellectually disabled students learn in much the same way as their non-disabled peers, it may be at a slower rate, but the processes are basically the same. The social nature of learning and the importance of
context and social interaction has been demonstrated. An environment which encourages interaction and provides demonstrations of literacy and opportunities to participate in literacy events is required. Contexts are a milieu of interrelated possibilities which provide support for literacy learning. Contexts which the learner can explore in different ways in the search for meaning are those which provide abundant environmental print and other supportive materials. In an environment where print is part of the natural surroundings it becomes 'natural' to relate to it. Support from teachers, interaction with peers and more experienced learners at home and in school is a vital part of literacy environments which encourage active involvement in the learning process.

Graves (1980), asserts:

Children show us how they seek to control writing when they go about composing. They show us their stumbling blocks and the orders in which they grow in the writing process, they don't show with any one behaviour, nor in an antiseptic laboratory setting. Rather they show us their growth patterns over a long period of time and in the setting where they normally function, the classroom. (in R.D. Walshe (Ed), 1981, p 17)

**Self-motivation**

Learners learn, the teaching can be supportive and guiding but the learning has to be done by the student. Help in the form of assistance to achieve a goal/complete a task which cannot quite be done alone is part of the learning process. 'What the student does today with help, he/she can do alone tomorrow.' (Vygotsky 1978)

What emerges from this investigation of the use of computers for writing is:

A learning environment that encourages active participation of learners and interaction among learners and teachers is vital to support academic
development. The data presented in this study supports the contention that the use of computers for writing can be a powerful force to increase motivation, provide stimulation and facilitate the writing process.

**Research Implications**

There is a need for further investigation of the use of computers in literacy learning in both general and special education.

• It is necessary that such research should be carried out in the classroom.

• Such research should be longitudinal, hitherto most research in this area has been relatively short term. Extended time is needed for the establishment of computer skills and the emergence of observable trends in learning processes. Some studies have been for short periods of only a few weeks. I suggest a minimum duration of two years. Cochran-Smith in a recent review of the use of word processing for writing in elementary classrooms recorded one study of young children of two year duration Kahn (1988), and one study with learning disabled students of two year duration, Morrocco (1987), two of one year duration, Catano (1985), Porter & Sherwood (1987) one over an academic year Daiute, (1986), and others of much shorter duration.

• Literacy learning is an open potential therefore all strategies and support structures and the ways they are utilised as the students seek to make meaning should be considered.

• Intellectually disabled learners are active learners as are their non-disabled peers. There is a need to examine the processes by which they learn and to look at literacy learning from their perspective - what it means to them.
This study was prompted by a concern about the lack of research into and information on the use of computers in special education, particularly with regard to literacy. What emerged was a clear indication that computer use for literacy learning can be a very positive and motivating educational experience for disabled learners.

Analysis of the data provided significant insights into the way intellectually disabled learners cope with literacy learning and the advantage to them of using computers for writing. These insights, discussed in Chapters Four and Five provide understanding of the processes and strategies employed by intellectually disabled students in their attempts to make meaning. It also highlighted the way these students went about learning how to use the computer in their literacy learning. A major factor in the learning process was the social contexts which served to generate the strategies observed and which offered support in the construction of texts.

This study has attempted to identify and explore the means by which mildly/moderately intellectually disabled learners cope with literacy learning and to identify the strategies they generate as the try to make meaning.

Social interaction and the importance of the surrounding culture in developing the potential for learning is a key factor in the view of both Vygotsky and Bruner. Vygotsky stresses that the outer limits of the potential for learning (which may not coincide with apparent limits when actual performance is the measure of developmental level) is the level at which instruction should be aimed. For intellectually disabled students this is an important precept, to 'use such intellectual potential as he may posses'
the support of the culture must be appropriate to his/her needs. I comment here that the children who were the subjects of this study achieved "higher ground" in their literacy learning when using the computer than would normally have been expected of them according to comments made by teachers, parents and principal during informal chats. From an educational perspective research is aimed at developing better understanding of the way in which learning in classrooms can best be facilitated and of the way learning environments can best be fitted to accommodate the needs of the student population.

The need for further studies is apparent in order to follow up the identified strategies and contexts of learning which have informed this study. Follow up interviews and observations of some of the students has confirmed their continuing interest in using the computer and their progress in literacy. It remains for future studies to continue the investigation of computer use for literacy learning in special education.

There is a need for further studies to determine if the use of computers is educationally appropriate as this study indicates. The resource issue would then be an appropriate addendum to any future studies.

A summary of one of the participants is presented below to illuminate the processes of learning observed.
Toward a Grounded Theory of Michelle's Literacy Development

Michelle demonstrated that she was not simply a 'passive learner' as children with intellectual difficulties are often portrayed, and as she herself had been described. Often events and influence from others would deflect her self direction but when her confidence was high she took the lead in her literacy development and indeed took on the role of instructor herself on some occasions. She used the same strategies (identified by other researchers) as children in regular classrooms, at a different rate admittedly but nevertheless she used them in the same way.

The use of the computer, I believe helped her to relate her writing to her reading and facilitated her literacy learning by allowing her to connect her texts with different contexts. This enabled her to engage with concepts encountered outside the classroom and to understand that all aspects of language are interrelated. Her use of intertextuality (life to text)/ text to life/text to text was very apparent. Most of her composing was derived from experience in other contexts.

In supplying texts for picture book illustrations she demonstrated her ability to decipher the message in the pictures and supply texts to fit them and transfer the text to the computer. This was in Vygotsky's terms 'decontextualisation of meaning'. In her use of experience, posters about the subject and other environmental aids when composing her text about the Tall Ships she again demonstrated the use of intertextuality very clearly - linking the posters, her knowledge from life experience and the related theme of the train journey to build her text.
Michelle was always reserved, overcoming her reticence as she came to trust me and to know there was nothing threatening or demanding in my presence. That there was no expectation of set performance levels from her, that she could go at her own pace or leave if she wished. With encouragement, she could be drawn out and would on occasions become quite expansive in her computer sessions particularly when engaged in composing a text which she was interested in, had knowledge of or had affection for e.g. her dog. What Michelle needed most was encouragement, support and to be allowed to make her own decisions in her literacy experiences. When she felt at ease, she would happily work at the computer and showed by her own actions the processes and strategies she used both independently and with assistance. I have no doubt that with continued use the computer would be a great help to Michelle.

I believe the non-threatening aspect, the fact that she was not expected to produce to a set standard was the key to her acceptance of the computer time. In the regular classroom where she had supposedly learned little she may have been so intimidated by the expectations of achievement that she just retreated and exhibited no evidence of learning. However she came to this project with letter, sound and word familiarity and the knowledge that she could express meaning in print so unless this was all gained in the home environment she must have been learning in her own way all the time.

Finally the assistance she requested and responses from myself, peers, teachers helped her to progress beyond the level she would have achieved
alone. She showed that her potential to do things was greater than was immediately apparent. With encouragement and support she reached out and achieved more than at first was expected of her. Vygotsky's zone of proximal development was well defined in her reaching inward and outward to promote her literacy learning.

To promote the current concept that every child should be educated to the limit of his/her capabilities educators need to consider the possibility that encouraging independent learning increases the child's inclination to independent learning and directing learning stifles autonomy. It appears from the data collected in this study that children with intellectual disabilities do follow the same pathways in literacy learning as their non-disabled peers. They should be encouraged to develop their abilities, to use their initiative and in the process to think abstractly. The tendency in special schools in the past has often been to use concrete 'look and do' methods, this reinforces dependence and suppresses abstract thought (Vygotsky, 1978, p 89).

**Summary**

This study concluded that the use of computers for writing did contribute to an improvement in literacy learning for the students taking part in the study. Improvement could be attributed to a number of factors. The interactive use of the computer in the language environment of the classroom; social interaction; the classroom ethos, and the researchers encouragement of independent learning whilst providing support when needed. The social context proved to be a major contributor, these factors combined to provide a supportive environment in which the students were
active participants in the learning situation. The students explored literacy whilst they explored the use of the computer to support their writing. as an integral component of the classroom environment the computer provided additional motivation to participate and facilitated writing in the ways described above.

The developmental trends identified highlighted the fact that the learning experience was a 'whole' experience and each element was a linked part of the whole. It is not claimed that these trends hold fast for all children in these particular sequences, indeed there were some differences within the small group participating in this study. Nevertheless identifiable patterns of behaviour did emerge which could provide information about learning processes and directions of progression in literacy learning for these children.
REFERENCES


Lyons, Carol A., Reading Recovery: An Effective Early Intervention Program for Children Classified as Learning Disabled. Ohio: Ohio State University


APPENDIX 1

METHODOLOGY
<table>
<thead>
<tr>
<th>Date</th>
<th>Literacy Event</th>
<th>Student Roles/Behaviours in Event</th>
<th>Copying</th>
<th>Writing &amp; Composing</th>
<th>Social Interaction</th>
<th>Environment</th>
<th>Editing/Behaviour</th>
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<tbody>
<tr>
<td>Sep 30,</td>
<td>Typed her name with assistance with letters from JC. Attempted again independently, approximating. Typed personal information copying from screen. Typed one sentence personal recount from life experience, with some assistance with letters and words. Typed PB.</td>
<td>1. Michelle observed JC show keys and typed her name as the letters were pointed out to her. She again typed her name with assistance from JC pointing to some letters but Michelle found some letters independently. She then typed her name MICLLE independently. She told JC “I am 6” and copied this from screen after JC typed it for her. She told of events and typed with assistance with spoken letters (she could relate to the sound of letters to find them on keyboard) and some pointed out to her. “I came to school on…” she used Q for O in “TO” but not in other words. Then she copied the rest of her sentence from printed words. She searched the keyboard for the letters, asked for help when unable to locate and typed the letters PB at the end after asking for them to be written when she could not find them.</td>
<td>Copied from her name from the screen, missed two letters. She copied accurately from JC printed words (upper case) for the end of her text.</td>
<td>Typed on the computer with some assistance. She approximated her name. She used personal information and life experience as the source of her text.</td>
<td>Michelle informed JC it was Monday (SI) and that her name was Michelle and she was six in response to questions (OI). She then told about coming to school on the bus and decided to write about that when prompted. (OI): JC showed how the space bar was used then prompted with “How do you leave a space between words?” when it was missed. Michelle</td>
<td>Copied from screen and copied from JC notes.</td>
<td>Used space bar to separate words after being shown. Remembered sometimes used delete and retyped when she hit a key in error. (sometimes hit the next key motor error)</td>
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<td>Oct 1,</td>
<td>Typed date on computer. 2. Dictated her composed text from her drawing in language book. 3. Typed her text on the computer.</td>
<td>Michelle copied the date from JC notes and inserted stops after being shown where it was on the keyboard. She then said “It’s Tuesday” and wanted to add the day. She showed her drawing in her book and told the story it represented, composing the text from the drawing.</td>
<td>Copied the date and the day from JC notes accurately. Copied from print (upper case) to provide subject of text. She missed two spaces and omitted “would” typed U instead of I (letters adjacent on keyboard - motor error).</td>
<td>Composed her text to describe what her drawing was about. Typed on computer independently.</td>
<td>Michelle asked “Where is that” pointing to the stop (SI) JC showed position on keyboard. Michelle said “It’s Tuesday, I’ll write that” (SI) JC printed ‘TUESDAY’ when requested to show Michelle how to write the day. JC looked at the drawing shown (SI) and asked Michelle what it was about. Michelle pointed to the figure of herself in the sky and said “I would like to fly up in the sky” JC printed the dictated story using upper case letters.</td>
<td>Copied from JC notes. Used her language experience drawing as source of text.</td>
<td>Inserted stops observing conventions (SI). Changed her text by omitting “WOULD”.</td>
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<tr>
<td>Interaction with Computer</td>
<td>Product of Event</td>
<td>Inferences Drawn</td>
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<td>1</td>
<td>Searched keyboard to find keys, purposefully. Used space bar with some prompting, leaving more than one space at times. Used delete key when aware of error.</td>
<td>MONDAY, MICHELLE MICHELLE MICLLE I AM 6 I AM 6 I CAME TO SCHOOL ON THE BUS AND DID MY LESSONS PB</td>
<td>1. Knows letter names and can find them on keyboard with a high degree of accuracy and occasional help. 2. Knows difference in letters and sounds with high degree of accuracy. 3. Recognises printed form of letters and can transfer them to keyboard. 4. Knows and understands the use/function of delete key and space bar. 5. Knows/understands that events in life can be told then converted to written text. 6. Can compose text which is congruent with events in life. 7. Can copy/transfer meaning from one medium to another with high degree of accuracy.</td>
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<td>2</td>
<td>Use of space bar, searches keyboard for required letters.</td>
<td>1.10.85 TUESDAY I LIKE TOFLY UP UN THE SKY</td>
<td>1. Knowledge of how to obtain literacy models from other sources. 2. Knowledge of conventions of writing date before text entry. 3. Awareness that letters written on paper are identical to those on keyboard. Can copy/transfer meaning from one medium to another with high degree of accuracy. 4. Can ask appropriate questions. 5. Can copy/transfer meaning from one medium to another with high degree of accuracy.</td>
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<tr>
<td>Date</td>
<td>Literacy Event</td>
<td>Student Roles/Behaviours in Event</td>
<td>Copying</td>
<td>Writing &amp; Composing</td>
<td>Social Interaction &amp; Environment</td>
<td>Editing Behaviour</td>
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<td>3 Oct 10, 1985</td>
<td>Typed her name and the date on the computer. Typed one sentence personal recount of past event.</td>
<td>Michelle looked at JC's notes and copied her name from lower case print and then copied the date, and inserted stops. Told JC what she had been doing at the weekend in response to questions. Decided to write about that and dictated 'I WENT TO THE BEACH'. She remembered the delete key and deleted when she hit a key in error. She used the space bar, independently when prompted, sometimes leaving more than one space. She searched the keyboard slowly and methodically, looking along the rows of keys for the required letters.</td>
<td>Copied her name and the date from JC notes accurately. Copied her text from JC print (Upper case) with a high degree of accuracy, missed one letter and omitted one space, used more than one space between some words. Typed on computer her name and the date copying independently. Composed her text from life experience and transferred from printed form to computer.</td>
<td>Michelle read her name from JC notes and copied from this. (Sl) She told JC she had been to the beach (O1) and JC printed this out for her. JC asked &quot;How do you go to the next word?&quot; when she hesitated between words, she remembered the space bar when prompted in this way (O1) and after a few reminders used it independently, checking by looking at JC for confirmation that this was correct (Sl). JC nodded or said &quot;That's right.&quot;</td>
<td>Inserted stops in date conventions. Used delete key to correct where errors occurred as she went along. Used space bar to separate words.</td>
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<tr>
<td>4 Oct 15, 1985</td>
<td>Typed date on computer. Typed her one sentence personal recount of past event.</td>
<td>Michelle copied the date from JC notes but did not put in the stops. She told JC &quot;Yesterday was a rainy day&quot; and copied this from JC print. She remembered the use of the space bar most of the time, occasionally missed one out. She found letters on the keyboard independently.</td>
<td>Copied date omitting stops. Copied from dictated text to provide subject of text. She omitted the A, but the rest was accurate. Typed on computer independently. Composed her text from life experience.</td>
<td>JC asked what she would like to write about. Michelle observed that yesterday it had been raining. Decided to write that, JC printed out the text in upper case.</td>
<td>Copied from JC notes. Omitted stops in date.</td>
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<td>Interaction with Computer</td>
<td>Product of Event</td>
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</table>
| 3                         | Use of delete key and space bar (operating functions). Searched the keyboard deliberately to find required letters. | Michelle 8. 10.85 I WENT TO THE BEACH  
Knowledge of conventions of writing date before text entry. Knows the conventions of stops. Knows that events in life can be told then converted to written text. Can copy/transfer meaning from one medium to another with a high degree of accuracy. Understands the discreteness of words. |
| 4                         | Use of space bar. Finds letters on keyboard without difficulty | 15 10 85 YESTERDAY WAS RAINY DAY  
1. Knows convention of writing date before text entry. 2. Michelle knows the discreteness of words and understands the use of the space bar. Understands events from life can be told and converted to written text. Can compose text which is congruent with life events. Can copy/transfer meaning from one medium to another with a high degree of accuracy. |
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<tr>
<td>Oct 21,</td>
<td>Typed date on computer</td>
<td>Michelle copied the date from JC notes. She told JC about her puppy Tiny Tim.</td>
<td>Copied date accurately.</td>
<td>Michelle typed her text on the computer, using speech for self and assistance from JC to put her ideas into words. (Joint composing) She used W for U but this was the only letter error. JC typed 'I HAVE A LITTLE PUPPY' underneath. She typed HS approximating 'HIS' independently. Source was information from life experience.</td>
<td>JC asked &quot;What would you like to write today?&quot; Michelle told JC &quot;I have a little puppy&quot; (SI) JC asked &quot;What do you call him?&quot; she answered &quot;Tiny Tim&quot; (OI) JC said &quot;Would you like to write about Tiny Tim?&quot; She nodded and started to type with assistance asking for help with &quot;Next letter&quot; and saying out the words as she typed but attempting letters herself when prompted with &quot;What do you think is next?&quot;. She typed directly from sound of letters, asked how to spell &quot;name&quot; after attempting.</td>
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<td>1985</td>
<td>Composing text from life experience</td>
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<td>Typing text on computer</td>
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<td>Oct 22,</td>
<td>Typed date on computer</td>
<td>Michelle typed her name copying from print, needed prompting, withdrawn and hesitant. She finally told JC her &quot;Daddy cane to school today&quot;. She copied this text from print but she was not as interested as usual.</td>
<td>Copied date name correctly. Then copied accurately from printed text as subject of text.</td>
<td>Typing on computer, her name and sentence from life experience with assistance.</td>
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<td>Feb 18, 1986</td>
<td>1 Typed her full name on computer 2 Typed words from chart 3 Typed words associated with the chart word</td>
<td>Michelle copied the date from notes then independently typed her first name, missed out the C but then attempted her second name, she started the first two letters correctly then asked for help. She copied 'RED' from a chart but then said she wanted to do it in small letters as on the chart. After being shown the shift key to change to lower case she retyped in lower case. Michelle said 'Big and little', copied 'big' from JC print and typed 'little' from spoken letters. She typed j instead of I but realised her error, deleted and corrected. She was reminded of her dog and said he was little. She copied 'dog Tiny' from JC print.</td>
<td>Copied date. Copied from chart to start text accurately. Copied from JC print as subject of text.</td>
<td>Michelle typed on the computer, started with her name then used a chart for ideas. She followed this with associated words following on from the word picked from the chart. Life experience provided associations.</td>
<td>Michelle typed her first name independently then asked for assistance with her surname. She asked how to get 'little letters the same as the chart.' Watched carefully as JC showed the shift key changed the letters and said 'big and little' then decided to type this. She copied this from JC print after asking for help. She typed j first and said &quot;no&quot; when she saw it on screen and changed to I. She then said &quot;My dog is little too. I'll write that.&quot; Again copied after asking for help.</td>
<td>Copied from chart as source of ideas.</td>
<td>Deleted j and corrected to I.</td>
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<td>Feb 25, 1986</td>
<td>1 Typed her name to retrieve file. 2 Typed one sentence from life experience</td>
<td>Michelle typed her name independently, she used the space bar independently and deleted to correct when she made an error. She told JC she had been to the circus(SL) and that she &quot;Saw a baby lion at the circus&quot; when questioned about what she saw there. Michelle copied from JC print of her dictated text.</td>
<td>Copied date. Copied from JC print to provide subject for text. She copied letters accurately, but reversed the E TH and omitted one space.</td>
<td>Typed on computer using her experience at the circus to provide the text.</td>
<td>Michelle told about visiting the circus (SL). Responded to question about what she had seen there. JC printed out the text when asked how to write it.</td>
<td>Uses delete to change letters when an error sometimes hits more than one key at a time and corrects herself (SL).</td>
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<td>Uses spacing competently and finds letters without difficulty. Used return to leave space between name and text</td>
<td>18.2.86. MIHELLE W.! RED red big little dog Tiny</td>
<td>1. Knows convention of writing date before text. 2. Knows how to scrounge literacy models from other sources. 3. Can associate words from one context to another context and relates to the meaning of words. 4. Knows the concept of 'little' has application to different phenomena but still retains the same meaning. 5. Knows letters and recognises errors.</td>
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<td>Uses space and delete keys. Finds letters on keyboard, searching for specific letters. Does not explore.</td>
<td>25.2.86. BABY LION AT ETHCIRCUS</td>
<td>Knowledge of conventions of inserting date before text. Responds to questions appropriately. Knows that events in life can be told and then converted to written text. Can compose text from life events. Can copy/transfer meaning from one medium to another with a high degree of accuracy.</td>
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<td>Mar 3, 1986</td>
<td>Typed date on computer and typed her name independently to retrieve her file. Typed one sentence personal recount of past event with assistance.</td>
<td>Michelle typed her name to retrieve her file and copied the date from JC notes. She then told JC about going to the Pizza Hut and typed her text on the computer directly with assistance with spoken letters when she asked for help. She attempted &quot;I WENT TO THE Pizza Hut&quot; with very little prompting but needed assistance with PIZZA HUT. She could read simple words such as cat cot mat cab from a word program and could select words that had the same letter in the same position.</td>
<td>Copied date.</td>
<td>Composed her text orally from life experience and typed directly onto the computer using speech for self and with assistance from spoken letters when needed.</td>
<td>Michelle told JC she had been to the Pizza Hut when asked what she had been doing. She decided to write &quot;I WENT TO THE PIZZA HUT&quot;. JC supplied letters when asked for help but encouraged Michelle to try to spell herself with &quot;What do think it is&quot; as Michelle said out the word.</td>
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<td>Mar 11, 1986</td>
<td>Typed her name on computer independently. Typed text from language drawing onto computer.</td>
<td>Michelle typed her name to retrieve her file independently. She used delete to correct when she made an error. She then typed the date. She copied from her writing book in lower case to start the sentence then noticed she should have started with a capital. She pointed to the upper case in the book asked how to change and experimented with the shift key, going from upper to lower case but did not go back to correct her starting words. She omitted spacing whilst concentrating on the shift and noted where two letters the same occurred together.</td>
<td>1. Copied date. 2. Copied from book to provide subject of text. She omitted spacing, but letters were all correct.</td>
<td>Michelle typed on computer a text which she copied from her class writing book.</td>
<td>Michelle brought her writing book to show JC and said she would &quot;Write from the book&quot;. She asked to be shown how to change the letters. JC demonstrated the use of the shift key and wrote down a number of letters in upper and lower case to show the letter remained the same. She said &quot;two the same&quot; when she typed p twice in &quot;happy&quot;.</td>
<td>Made use of her classwork to provide text.</td>
<td>Used delete to remove unwanted letters. Changed from lower to upper case to conform to print in book. Used stop at end of sentence as in book.</td>
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<td>9 Uses space consistently and independently. Finds letters without difficulty.</td>
<td>3.3.86, I WENT TO THE PIZZA HUT</td>
<td>1. Knows conventions of writing date before text. 2. Can compose text from life experience. 3. Knows that word sounds can help with spelling. 4. Can read and write some simple words.</td>
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<td>10 Experimented with shift key and forgot her use of the space bar except for one space</td>
<td>11.3.86, I would be THE HAPPY CLOWN AT THE CIRCUS.</td>
<td>1. Knows conventions of writing date before text. 2. Knows how to scrounge literacy models from other sources. 3. Put other concerns (spacing) out of mind whilst concentrating on conventions of upper and lower case.</td>
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<td>Mar 18, 1986</td>
<td>1 Typed name on computer. 2. Typed one sentence statement from life experience.</td>
<td>Michelle typed her name independently to retrieved her file. She decided to write about her friend and attempted the beginning of her text independently then asked JC to write down the rest of her dictated text. She started in upper case with 'I L' then changed to lower case and continued with 'I Lik' saying out the words then asked for help.</td>
<td>Copied from JC print to assist in text being composed. She copied accurately but in lower case after the initial start although JC printed in upper case and Michelle did not remember to use a capital for her friends name.</td>
<td>Typed on computer her text from life experience. She started independently and approximated Lik for like. She used speech for self to help with this.</td>
<td>Michelle told JC she would write about her friend. (SI) Her text was dictated as &quot;I like to play&quot;. She started to type this independently, pointing to letters before typing and looking for confirmation it was right each time she typed a letter. She then asked JC to &quot;Write it down&quot; JC printed E in capitals saying &quot;there is an E at the end of like&quot; &quot; TO PLAY&quot; when Michelle had copied this she said &quot; WITH PATRINA&quot; and copied this from print.</td>
<td>Changed from upper to lower case. (SI)</td>
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<td>Apr 14, 1986</td>
<td>1 Typed her name on computer independently. 2. Typed her friends name independently 3. Typed text from a story in her workbook.</td>
<td>Michelle typed her name independently to retrieve her file. She typed the date and pressed return to move down to leave a line space after JC did this after the date. She then typed &quot;PATRINA&quot; independently. She looked through her workbook and decided to copy from the story which she read out &quot;The balloon floats in the air&quot;. She used upper case and copied without any assistance.</td>
<td>Copied accurately from her workbook to provide subject for text. She transferred from lower case print to upper case type.</td>
<td>1 Typed names independently. 2. Used workbook as the source of text and idea from previous lesson.</td>
<td>After typing her own name and date she said &quot;Now Patrina&quot; (SI) and typed independently. Michelle showed her workbook to JC and selected the text she would copy (SI) read it out accurately.</td>
<td>Use of workbook as source of text.</td>
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<td>1. Use of space bar was almost correct, only one I Like omitted. She attended to the use of the shift key but has not completely mastered it yet, used small letter for name. Has no problem finding letters. Retrieves file independently. Gaining control of operating functions.</td>
<td>18.3.86 I Like to play with patrina</td>
<td>1. Michelle is beginning to attempt invented spelling but needs re-assurance. 2. She is gaining control of conventions and is coping with both spacing and change of case fairly well but not completely accurate at this stage. She realised she only needed a capital to start the sentence but did not correct the capital at the beginning of 'Like' and did not use a capital for her friends name.</td>
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<td>Retrieval of file, use of spacing and return key. Gaining control of operating functions.</td>
<td>14.4.86 PATRINA THE BALLOON FLOATS IN THE AIR</td>
<td>1. Knows convention of date before text 2. Knows a new line is required for the next operation. 3. Knows how to scrounge literacy models from other sources. Knows conventions of spacing between words. 4. Can transfer from one medium to another and from upper to lower case or vice versa. Knows that the letters are the same and have the same meaning value in words.</td>
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<td>Deleted K and replaced with C.</td>
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<td>April 15, 1986</td>
<td>1. Typed her name on computer. 2. Typed one sentence recount of past event. 3. Typed 'computer' relating to life experience.</td>
<td>Michelle typed her name to retrieve her file independently. Told JC that she had a birthday party at school and copied from printed version of her dictated story. She then told JC she would be getting a computer at home and started to type, asked if it began with K.</td>
<td>1. Copied from printed version of dictated text as subject of text. Copied letters accurately but omitted spaces. 2. Copied printed word accurately.</td>
<td>1. Typed her personal recount of past event on the computer. Used speech for self to help with 'PARTY AT' typing some letters (PAT) independently. 2. Typed word related to message conveyed to JC.</td>
<td>Michelle told JC she had a birthday cake and a party at school (SI). JC printed out her dictated text as requested. Michelle then informed JC that she was going to have a computer at home. She started to type K then asked if computer started with K. JC asked &quot;what other letter sounds the same sometimes?&quot; and printed K then C when Michelle said &quot;C&quot;. JC printed out 'COMPUTER' and Michelle copied from this.</td>
<td>Used language book as source of text. Copied from chart for subject of text.</td>
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<td>April 21, 1986</td>
<td>1. Typed name on computer independently. 2. Typed complex sentence using language drawing caption as source.</td>
<td>Michelle typed her name to retrieve her file independently. She showed her language experience book to JC and read out the caption, pointing to the parts of the drawing that represented her spoken text. She copied from this independently. She used lower case for this and omitted space but inserted one between the two separate parts of the sentence. She looked around the room at charts and copied red yellow blue. She repeated this but typed red independently the second time but referred to the words on the screen for help with yellow and blue. She used spaces to separate these single words.</td>
<td>1. Copied from language book fairly accurately, missed only one letter (I), but omitted capitals to start and all except one space. 2. Copied words from chart and screen. Copied for subject of text.</td>
<td>1. Used material from language book as source of text. Copied from book, chart and screen, did not compose independently. She repeated words copied from chart attempting part independently.</td>
<td>Michelle showed her book to JC and read out the text, showing the drawing and explaining the context. (SI) JC asked &quot;Are you going to write about that?&quot; Michelle copied from the book then looked around the room for ideas. (SI) She decided on colours, they had had a unit on colour in class the previous week. She copied these correctly then decided to repeat, (SI) using memory to start. JC asked &quot;What does that say?&quot; Michelle read out the colours from the screen with assistance for blue, she knew red, composed yellow from beginning letters but not blue (OI).</td>
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<td>Retrieved file independently by typing name. Did not use space bar correctly. Searched for required letters.</td>
<td>15.4.86 I H A D A B I R T H D A Y P A R T Y A T S C H O O L COMPUTER</td>
<td>1. Michelle knows convention of date before entering text. 2. Knows understands that events from life can be told and transferred to written text. 3. She is trying to take control of words and attempts some instead of referring to print. 4. She knows letters and sounds and can identify letters with identical sounds.</td>
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<td>Retrieved file independently. Forgets spacing and capitals when concentrating on other matters. Has an understanding of functions but does not always remember to use them.</td>
<td>21.4.86 thats mark a n s o m e friends this is pat rina red yellow blue red yellow blue</td>
<td>Knows she can transfer meaning from one medium to another and can copy accurately. Her concentration at times strays to concerns other than conventions and she omits spacing and capitals when more complex texts are produced. Knows how to scrounge literacy models from the environment and other sources. Knows she can get help with spelling from charts and previous work on screen.</td>
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<td>May 20, 1986</td>
<td>1. Typed her name on computer. 2. Read out the date in full from abbreviated notes. 3. Selected a book and copied from it retaining the colour theme but adding to it.</td>
<td>Michelle informed JC “It's Tuesday the 5th May.” JC wrote this down in full but Michelle typed the abbreviated date. She selected a book and said “Rainbow colours” (SI). Michelle said out letters as she typed, copied from screen then asked JC to help with brown. JC said out the letters after Michelle started with B.</td>
<td>Used book as source of text. Copied from screen to assist her text, selecting the words she wanted self directed.</td>
<td>Used delete to correct when error made. Changed from upper to lower case.</td>
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<td>Jun 3, 1986</td>
<td>1. Typed her name on computer. 2. Typed one sentence text from life experience.</td>
<td>Michelle informed JC “Today is Tuesday 3rd June” (SI) as she recorded the date. She then followed this with the observation that this was the day that they had the computer in the classroom (SI). She asked JC to write it down for her (SI). JC printed Tuesday 3rd June - the day we have the computer. Michelle copied the information about the computer but ignored 3rd June, she had already typed the date.</td>
<td>The day and date were written on the board and had been referred to in class.</td>
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<td>15 Retrieved file by typing her name. Used spacing in the first section but not in the repeated words. Changed from upper to lower case part of the way through rainbows.</td>
<td>20.5.86. MICHELLE RAINBOWs green blue yellow reb brown green blue yellow reb</td>
<td>1. Knows the convention of writing date before text. 2. Used repetition to reinforce previous work. 3. Knows how to scrounge literacy models from the environment. 4. Knows she can ask for help when needed and can ask appropriate questions.</td>
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<td>16 Retrieved file by typing name. Used spaces correctly. Finds letters easily.</td>
<td>3.6.86. tuesday is the day we have the computer</td>
<td>1. Knows conventions of date and has attended to the board when the day was written there. Retained in memory. 2. Is aware that the computer days are a regular part of the week and knows the days to expect the computer. 3. Knows that events can be told and recorded in print and transferred to the computer. 4. Can copy with a high degree of accuracy from one medium to another. 5. Knows letters and conventions of spacing but is intermittent in her use of capitals.</td>
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<td>17 Jun 24, 1986</td>
<td>1 Typed her name on computer. 2 Typed sentence on computer independently.</td>
<td>Michelle typed her file to retrieve her name and indicated &quot;Two L's in Michelle.&quot; She typed the date and hit 43 together but did not notice the error. She looked around the room for ideas and copied from a poster THE COLOURS, pointed to the two L's in her name, then said &quot;No that's wrong&quot; and corrected to 'COLOURS.' She continued copying from the poster, changed to lower case after COLOURS, she missed two spaces and put a stop at the end of the sentence. She read out the words with some assistance with 'COLOURS' and PURPLE.</td>
<td>Copied accurately, only missing spaces to provide subject of text.</td>
<td>Typed on computer, copying from a poster. She was continuing the colour theme from earlier classwork.</td>
<td>Michelle retrieved her file by typing her name and said &quot;Two L's&quot; pointing to her name. (SI) She looked around and selected a poster with a rainbow and copied the text from it. (SI) She put two L's in colour, looked at JC and said &quot;Only one L,&quot; she deleted to correct. (SI) She said out the words with a little prompting and pointed out other the colours in the poster. (OI)</td>
<td>Copied from poster for text. She looked around and selected the poster because of its content.</td>
<td>Deleted to correct the word she had misspelled (SI) - Spelling. Put stop at end of sentence.</td>
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<td>18 Jul 8, 1986</td>
<td>1 Michelle typed her name on computer. 2 Typed the day after the date. 3 Attempted her name in full and typed her dog's name. 4 Typed single words from poster illustrations. 5 Typed a sentence from book.</td>
<td>Michelle retrieved her file and typed the date and used return key to move down a line, then added the day, approximating with some assistance. She typed her full name but type G instead of N at the end of her surname, she then typed TINY unaided. She looked around the room for ideas and typed words some that were represented by illustrations on posters, identifying and saying out the words and attempting to start, asked for help when she couldn't complete. She typed BEAR with assistance, RED unaided, BONNET was copied CLOWN with assistance after the first two letters, CLOC and OCTA were her own approximations for CLOCK and OCTOPUS. She copied CIRCUS and LEAVES then picked out a book and copied from that. She kept using G instead of N as she had in her name in the sentence IWAGTABAGAGA (I want a banana) PLEASE UGGLE. She then went back to selecting words from posters.</td>
<td>Copied a few words posters correctly as subject of text. Copied from book not very accurately subject of text.</td>
<td>Typed on computer, attempted her full name. She selected illustrations and identified by name then attempted to spell a number of single words, using speech for self. Asked for assistance with some. She copied from a book as source of text.</td>
<td>Michelle retrieved her file then said &quot;It's Tuesday&quot; and typed 'TUESDAY' underneath after pressing return to move down (SI). She typed her name then said &quot;Now Tiny&quot; and typed this unaided (SI). She looked around the room and pointed to an illustration of a bear and said &quot;Bear&quot; and started to type B then asked for help with letters (SI) She continued selecting illustrations and attempting to type the words, some words she copied from posters, saying out the words and letters (SI). She picked out a book and read out a sentence with assistance from JC, then</td>
<td>Referred to posters for ideas and to copy accurately as subject of text - Random searching, looking for something to write about. Used a book as source of text.</td>
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<td>Interaction with Computer</td>
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<td>17</td>
<td>243. 6. 86. THE COLOURS are in the sky red and yellow purple.</td>
<td>1. Knows conventions of date before text and is observing the day when it is written on the board in the morning. 2. Knows that two letters together are significant, tried to apply in another word where the same letter occurred but realised it was incorrect so the rule was not always &quot;Two L's&quot; understood it did not always apply. 3. Can copy with a high degree of accuracy. 4. Can recognise the theme of colour when she sees a rainbow or other examples of colour. 4. Knows she can transfer meaning from poster to computer.</td>
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<td>18</td>
<td>8. 7. 86. TUESDAY. MICHELLE W ---- G TINY BEAR RED BONNET CLOWN CLOC OCTAS CIRCUS LEAVES IWAGTABAGAGAPLEASS UGGL E FUR PANTHER CAC KANGAROO</td>
<td>1. Knows convention of date before text and is adding the day too, is aware the day is identified with the abbreviated date. 2. Can type her name independently and other familiar names. 3. Knows how to scrounge literacy models from other sources. 4. Can copy with a high degree of accuracy but loses concentration sometimes. 5. Knows that meaning can be transferred from one media to another (poster, book, spoken word to computer).</td>
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1. Retrieved file by typing name. 2. Hit two keys together. 3. Used shift key to change to lower case as on the poster, and delete to correct. Used spacing. Using operating functions.

1. Retrieved file by typing name. 2. Used return to move down to a new line. Used spacing except when copying from the book. Mixed G with N, this was unusual, perhaps lack of concentration.
<table>
<thead>
<tr>
<th>Date</th>
<th>Literacy Event</th>
<th>Student Roles/Behaviours In Event</th>
<th>Copying</th>
<th>Writing &amp; Composition</th>
<th>Social Interaction</th>
<th>Environment</th>
<th>Editing Behaviour</th>
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<tr>
<td>Jul 14, 1986</td>
<td>1. Typed name on computer. 2. Typed sentences from book on computer. 3. Typed two sentences from life experience with some assistance. 4. Typed her oral interpretations of pictures in a book on the computer. Michelle typed her name to retrieve her file and brought a book and proceeded to copy sentences and words. She used return to leave a space before starting and to go to the next line between each line of text. She changed to uppercase to start a sentence and back to lowercase to complete it, one sentence was all in uppercase where the text was repeated but “big” replaced “little”. She used a capital to start a line of single words too. She told JC “I have a big bike” she typed “Michelle has a” unaided, then asked for help with “big bike” attempted to type saying out the letters and asking if correct, she completed “bike” from JC print, and put a stop at the end of the sentence. She then informed JC she had been to see a show with mummy. She typed “Michelle” unaided and sounded out W E N T as she typed it then typed “to” unaided. She needed assistance to type the rest of her text, and again used a stop at the end of the sentence. Michelle then picked up a picture book and went through it, identifying the “story” of the pictures. She typed from this, asking for help with some spelling and copying from JC print, but the words were Michelle’s interpretation of the pictures. She was telling what the pictures were showing. She typed “GIRL HAS TWO COATS” asking for help with GIRL and COATS, most of the rest were copied from JC print, but she typed TOY unaided.</td>
<td>1. Copied text accurately from book to provide subject. Copying for copyings sake.</td>
<td>1. Typed computer. 1. Copied her own text from life experience with some assistance and using speech for self. 3. Composed text from pictures and typed this with some assistance.</td>
<td>Michelle told JC she had a big bike (SI). JC said “Well, you can write about that”. (OI) After typing that, she then went on to describe a visit to a show with her mother, “With music and dancing - it was very nice” (SI). JC said “You must have enjoyed that very much, shall we write about it?” and helped with letters when asked. Michelle read out from picture book, pointing and making observations about what was going on. JC responded and pointed out some of the words Michelle supplied when asked.</td>
<td>1. Used news she had as source of text and ideas. Looked for text to copy in the first book but provided the text to fit the pictures in the second book.</td>
<td>Use of shift key and put stops at end of sentence. Use of conventions to format.</td>
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<td>Jul 29, 1986</td>
<td>1. Typed name on computer. 2. Typed informative sentence composed from life experience with assistance with letters. 3. Typed her one sentence text from life experience, copying from screen. 4. Typed complex string of related sentences from life experience. Michelle retrieved her file and put in the date, typed July in full, checking on board. She then volunteered an observation “Snow is cold and white”, she type this copying from JC print. She responded with “I saw a show with singing and dancing” when questioned about what she had been doing. She copied from this the screen after JC typed it for her and put a stop at the end (SI). She then related news about her dog and how she plays with the dog. She became quite informative and was interested in writing about her dog. She typed directly on computer with some oral prompting when she asked for the “next letter”, she put a stop at the end of each sentence a comma was used but was probably intended to be a stop. Michelle collected materials from round the room to look at and write about. We spelled out together as she typed. Michelle picking out what she would use.</td>
<td>1. Copied her text from life experience accurately from JC print. 2. Copied accurately from JC print.</td>
<td>1. Typed on computer, copying from book. 2. Typed her own text from life experience with some assistance and using speech for self. 3. Composed text from pictures and typed this with some assistance.</td>
<td>Michelle volunteered an observation that “Snow is cold and white”. (SI) There had been a news report that snow had been falling in the nearby mountains. The class had talked about in news for the day. Her second text from life experience was a repetition of or continuation from the previous week. 3. The third life experience text was a recount of her experiences with her pet and was added to as she composed and typed. As she finished one sentence, she thought of other things to add to the.</td>
<td>1. Used news she had as heard as source of text. 2. Used screen to copy from. 3. Used materials from around the room, selecting interesting items as subjects of text.</td>
<td>Use of books as source of text and ideas. Looked for text to copy in the first book but provided the text to fit the pictures in the second book.</td>
<td>Use of shift key and put stops at end of sentence. Use of conventions to format.</td>
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<td>Interaction with Computer</td>
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<td>Retrieved file by typing name. Used shift competently. Put in stops. Used return deliberately to format text. Gaining control of operating functions.</td>
<td>14. 7. 86. This is a little horse THIS IS A BIG HORSE This is a kite This is a lemon This is a tomato Horse dog saucepan cup horse comb Michelle has a big bike. Michelle went to see a show with mummy. pram GIRL HAS TWO COATS. HOOVER THREE LADIES HAIR RICH BAG SKIPPING ROPE TRUCK FISHING LINE TOY GARDEN FORK</td>
<td>1. Knows conventions of new line, stop at end of sentence and use of capitals to start a sentence. 2. Knows how to scrounge literacy models from other sources. 3. Knows letter/word sounds can help her to spell. 4. Can copy with a high degree of accuracy from one medium to another. 5. Can compose text from life experience. 6. Can translate pictures into words and compose text from pictures.</td>
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<td>Retrieved file by typing name. Used stops correctly. Found keys without any errors. Controlling operating functions.</td>
<td>29 JULY 1986. SNOW IS COLD AND WHITE I SAW A SHOW WITH DANCING AND SINGING. MY DOG TINY DIGS IN THE GARDEN. WE PLAY WITH BALLS IN THE GARDEN TOO. I LAUGH AND SHOUT IT IS LOTS OF FUN, I LOVE MY DOG. TRIANGLE RECTANGLE CLOWN CIRCLE</td>
<td>1. Knows conventions of date before text and that it can be abbreviated or in full and still means the same. 2. Knows how to scrounge literacy models from print, from spoken ideas and from objects. 3. Can relate continuing ideas and add to text as she composes. 4. Can transfer text from one medium to another conceptually. 5. Can copy with a high degree of accuracy from one medium to another.</td>
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<td>Social Interaction</td>
<td>Observed conventions by formatting new line for each separate subject</td>
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<td>Sep 18, 1986</td>
<td>1. Typed the date and her name on the computer.</td>
<td>Michelle retrieved her file then copied the date from JC notes and typed her name again, forgot to use capital. She decided to write words beginning with R and thought of Ricky. She typed ‘ricky’ unaided and asked for help to spell ‘starts with’, she changed to upper case for R, then back to lower case and used return to start a new line. She copied ‘four’ from a chart, said “Four starts with F” and added ‘starts with’ checking on the previous line on screen to help her spelling. She followed this procedure for one, two and three, saying out the starting letter for each. For three the r was missed from ‘starts’. She copied spider from a poster but typed b for d. Michelle selected a chart with a frog on it and copied from this. The ‘starts with’ was approximated this time without checking and became ‘starts th’. She used lower case except for R and used spacing and return consistently, only missing one space.</td>
<td>1. Copied the date accurately. 2. Copied words from charts accurately to assist with text being composed. 3. Copied from screen to assist spelling.</td>
<td>Michelle retrieved her file, typed the date and her name then said “I am going to write words that start with R.” (Si) She looked around the room and said “Ricky starts with R”. (Si) She typed ‘ricky st’ unaided then asked for the next letter. JC supplied AR, Michelle completed TS with prompting, then started WI, saying out slowly, needed help to decide on I, JC said out TH and supplied letters. Michelle copied numbers from chart and continued as before, checking the screen and repeating the text. She said out the starting letter for each selected word before typing. JC responded. Michelle retrieved her file and typed the date and her name. She corrected independently when she made an error (Si). She told JC she had got wet feet coming to school, a conversation about rain and how to keep from getting wet feet resulted in a comment about ducks liking the wet weather, and she said “If I had feet like a duck I wouldn’t get wet.” She decided to write about that and composed a text (Si). She started independently then asked “What’s the next letter?” when she needed help. JC supplied the requested help. Michelle read out her text.</td>
<td>Michelle retrieved her file, typed the date and her name then said “I am going to write words that start with R.” (Si) She looked around the room and said “Ricky starts with R”. (Si) She typed ‘ricky st’ unaided then asked for the next letter. JC supplied AR, Michelle completed TS with prompting, then started WI, saying out slowly, needed help to decide on I, JC said out TH and supplied letters. Michelle copied numbers from chart and continued as before, checking the screen and repeating the text. She said out the starting letter for each selected word before typing. JC responded. Michelle retrieved her file and typed the date and her name. She corrected independently when she made an error (Si). She told JC she had got wet feet coming to school, a conversation about rain and how to keep from getting wet feet resulted in a comment about ducks liking the wet weather, and she said “If I had feet like a duck I wouldn’t get wet.” She decided to write about that and composed a text (Si). She started independently then asked “What’s the next letter?” when she needed help. JC supplied the requested help. Michelle read out her text.</td>
<td>Observed conventions by formatting new line for each separate subject.</td>
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<td>Oct 10, 1986</td>
<td>1. Typed the date and her name on the computer.</td>
<td>Michelle typed her name to retrieve her file and typed the date, then retyped her name. She used delete to correct when she made an error in her name. She told JC she got wet in the rain and thought it would be good if she had feet like a duck. She typed ‘I WI’ unaided, sounding out the letters. JC helped with SH. Michelle typed ‘THAT I AD’ unaided, JC supplied CK after Michelle started DU and asked for help with DUCK. Also prompted the second E in FEET. Michelle put a stop at the end of her sentence, read her text through and pointed to AD and decided it was wrong (Si). She corrected this with assistance from JC to show how to use cursor keys to go back without deleting other words.</td>
<td>Copied date accurately.</td>
<td>Typed her name on computer and the date. She composed a text from her imagination, thinking of ways to cope with rainy days and avoid getting wet feet. She typed this with some assistance, using speech for self.</td>
<td>Corrected an error in name by deleting and retyping (Si). 2. Edited by correcting a word with some assistance after recognising an error independently (Si). Put stop at end of sentence. (Si)</td>
<td>Corrected an error in name by deleting and retyping (Si). 2. Edited by correcting a word with some assistance after recognising an error independently (Si). Put stop at end of sentence. (Si)</td>
<td>Corrected an error in name by deleting and retyping (Si). 2. Edited by correcting a word with some assistance after recognising an error independently (Si). Put stop at end of sentence. (Si)</td>
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<td>21 Retrieved file by typing name. Used return and space keys. Did not use shift key except for one letter.</td>
<td>18.9.86. Michele ricky starts with R. Four starts with f. One starts with o. Two starts with t. Three starts with th. Spider starts with s. Frog starts with f.</td>
<td>1. Knows the conventions of writing date before text. 2. Knows how to scrounge literacy models from a number of sources, uses the environment in different ways. 3. Can copy with a high degree of accuracy from one medium to another. 4. Is using previous knowledge from lessons to compose text. 5. Can identify starting letters from sound of words.</td>
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<td>22 Retrieved file by typing name. Used editing procedure with assistance. Used stop correctly. Selects letters without difficulty. Used return repeatedly to leave space between date, her name and her text. Use of operating functions.</td>
<td>30.10.86. Michelle. I wish that I had duck feet.</td>
<td>1. Knows conventions of writing date before text. 2. Knows function of stop at end of sentence. 3. Can compose text from imagination &quot;What if..?&quot;, may have heard comments from others. 4. Can recognise an error and knows it can be corrected. 5. Can follow instructions on use of computer functions.</td>
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<td>Nov 21, 1986</td>
<td>1. Typed her name on computer. 2. Copied from book. 3. Composed text from life experience.</td>
<td>Michelle typed her name to retrieve her file, she got a book from the shelf and started to copy from it. She used lower case and typed i for I which she had not done for some time. She tired of copying and talked about the camp she had been to. She told about the camp activities but was not prepared to type herself. She said I could type the story for her. She composed the text telling what she had done.</td>
<td>1. Copied text from book in lower case. Used return to follow format, typed i for I and omitted spacing in the first line.</td>
<td>Typing on computer using a book as source of text. Composed a text from life experience and asked JC to do the typing.</td>
<td>Michelle typed her name to retrieve her file and picked a book to copy from. (SI) She tired of that and started to tell about her camping experience. (SI) JC asked what did you do at camp? She said &quot;We had lots of fun. We went walking&quot; JC asked &quot;What else did you do?&quot; She responded &quot;Fishing and climbing. It was lots of fun&quot;.</td>
<td>Used book as source of text.</td>
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<td>Retrieved her file by typing her name. Typed the date. She mistook i for 1, this was unusual, she made this error in the first stages of computer use but had overcome the problem.</td>
<td>21.11.86. littlemissmuffet sat on her tuffet MICHELLE WENT TO CAMP AT THE CAMP SHE HAD LOTS OF FUN SHE WENT WALKING AND FISHING AND CLIMBING (Typed by JC from Michelle's recount of the experience.)</td>
<td>1. Knows conventions of date before text. 2. Can copy accurately but sometimes loses concentration. 3. Can compose text from life experience and recall events to provide the subject of text. 4. Did not wish to make the effort to type herself but wanted the text recorded. 5. Knows she can ask for assistance.</td>
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<td>Retrieved file by typing her name. Typed her text using spaces and finding letters without difficulty.</td>
<td>12.3.87. MICHELLE HAS A NEW CLASSROOM</td>
<td>1. Knows conventions of date before text. 2. Can report events and compose text from life situations. 3. Knows letters and can spell from sound fairly well. 4. Knows to ask for assistance when uncertain.</td>
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<td>Mar 19,</td>
<td>1. Typed her name on the computer. 2. Typed her news with assistance.</td>
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<td>1987</td>
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<td>Michelle typed her name to retrieve her file but checked to see if correct as she did so, hesitating after each letter until I said &quot;right.&quot; She typed her news text with prompting with letters and confirmation that it was &quot;right&quot; as she went along. She asked how to spell &quot;Friends&quot; and typed b for d, an error she has not made for some time. She used lower case and typed zero for o twice.</td>
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<td>Typed her name independently but needed confirmation it was correct. She composed her text from life experience and typed but asked for confirmation of each letter, hesitated and said out, then waited until JC said &quot;Yes that's right.&quot;</td>
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<td>Michelle typed her name but checked by waiting for confirmation it was right. (SI) She told JC she had lots of friends (SI). JC said, &quot;That's good news, you should write about that.&quot; (OI) Michelle began typing but wanted support and confirmation. She asked for help with 'news' and 'friends' the rest she attempted but checked each letter before typing, saying the letter out and waiting to be told it was right.</td>
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<td>Michelle retrieved her file and told JC she was going to bring her computer to school the next day. (SI) JC said, &quot;Are you going to write about that?&quot; (OI) Michelle said yes and started independently with her name and continued with prompting and help with letters for GOING, BRING, COMPUTER, she typed SCHOOL unaided and needed some assistance with TOMORROW but type the first three letters unaided. She then typed her own name and said &quot;I'll write Kim&quot; She typed it unaided then checked on the chart to make sure it was right (SI). JC asked about lessons and</td>
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<td>Checked on chart for spelling- self directed.</td>
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<td>Ap 2, 1987</td>
<td>1. Typed her name on the computer. 2. Typed a sentence from life experience with assistance. 3. Typed her own and friends name. 4. Typed comment about lessons.</td>
<td>Michelle typed her name to retrieve her file then the date and used return to leave a line space. She told JC she was going to bring her computer to school and typed a sentence with assistance with letters and sentence structure. She typed her own name again and KIM but checked on chart to assure herself it was correct. She then typed 'PE is good' asked for assistance with GOOD but started G herself and said out the word to complete with D.</td>
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<td>25</td>
<td>19.3.87</td>
<td>1. Knows conventions of date before text. 2. Is going through a period of wanting to be 'correct', she had a computer at home by this stage and was expected to spell correctly. 3. Can compose text from internal knowledge -news. 4. Knows letters, occasionally mixes b and d.</td>
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<td>2.4.87</td>
<td>1. Knows conventions of date before text. 2. Can compose from inner thoughts about intentions. 3. Is regaining confidence in trying to spell herself. 4. Knows that thoughts can be told and transferred to text. 5. Can respond to questions and type response on computer. 6. Knows how to scrounge literacy help and where to look for specific things.</td>
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1. Retrieved file by typing name independently. 2. Used return to leave space between date and text. 3. Is in control of operating functions.

1. Retrieved file by typing name. 2. Used return and space bar (Missed only one space). 3. Has control of keyboard and some operating functions.

MICHELLE IS GOING TO BRING HER COMPUTER TO SCHOOL TOMORROW.

MICHELLE KIM PE IS GOOD.
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<th>Student Roles/Behaviours In Event</th>
<th>Copying</th>
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<tbody>
<tr>
<td>May 7, 1987</td>
<td>1. Typed name on computer. 2. Typed date in full. 3. Typed colour names from memory.</td>
<td>Michelle tried to follow procedures to retrieve file as shown and typed her name as usual to complete retrieval. She typed the date in full, checked the spelling on the board. She told JC she liked the colours red and yellow and blue and green and typed this unaided. She checked the spelling of yellow and green on a chart after spelling them correctly herself but with red and blue she was confident that she had it right.</td>
<td></td>
</tr>
<tr>
<td>Jul 2, 1987</td>
<td>1. Typed full name on computer independently. 2. Typed one sentence description of her work in process writing book with assistance. 3. Typed a sentence about her friend. 4. Typed a one sentence recount of past event.</td>
<td>Michelle typed her full name independently and correctly and then an informative sentence about what she had drawn in process writing. She said out the words and letters and asked for help with PICTURE, ABOUT and HOUSE. She added a stop at the end of the sentence without prompting. She copied from JC's printed version of her dictated text about her friend Emma, continuing on the same line and did not put a stop at the end of the sentence. She then told JC that the class had visited McDonalds, she used return to go to a new line and copied this text from JC's print, again did not use a stop at the end of the sentence. She was initiating conversation and deciding what to write without prompting.</td>
<td>Copied her independently dictated text from JC print correctly. Copied her second text without errors. Composed in conversation.</td>
</tr>
</tbody>
</table>
Typed the date on the computer, independently. She typed the colours she named but did not compose a sentence.

Michelle said "Can I do that?" and operated the function keys to retrieve the file as JC showed her which ones were needed, reading out the instructions for her from the screen menu to explain what was being done (SI). She typed her name independently to complete the retrieval procedure (SI). She said out the date "Seventh of May 1997" and typed this independently (SI). She then told JC "I like red and yellow and blue and green." (SI). She typed this too.

Checked the spelling of May on the board. Checked on chart to make sure that her spelling of yellow and green was correct.

Her subjects were provided by her topic of conversation, her work in process writing, previous lesson, and information about her friends. She typed independently on the computer her full name then a text describing what she had done in process writing, which was an extension of the label 'This is Michelle's house' in the book. She put a stop at the end of the sentence. She used speech for self and asked for help with some words. She then copied from JC print.

Michelle showed JC her process writing book and pointed out a drawing of a house. She said "That's my house" and typed her name independently then added 'I DID A PICTURE ABOUT HER HOUSE saying this out and asking for help with the longer words. She then told JC she was going on holiday and Emma was too. She asked JC to write it down and copied from print. Michelle told about the class all going to McDonald's and asked for this to be written down and copied from the print on to the computer.

Used her process writing book as a source of text.
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<tbody>
<tr>
<td>2.7 Retrieved her file following instructions. She used return to go to a new line after the date and spaced correctly but used lower case. She is taking more notice of operating functions.</td>
<td>7 May 1987 Red and yellow and blue and green</td>
<td>1. Knows convention of writing date before text and that the date can be represented in different ways. 2. Knows some words in memory and knows where to look to check her spelling.</td>
</tr>
<tr>
<td>2.8 Retrieved her file by typing her name. She used spacing and a stop at the end of a sentence, then return to separate topics. Operating functions are used sometimes. The shift key was not used on this occasion, all the text was in upper case.</td>
<td>2.7.87 Michelle W did a picture about her house. Emma is going on holiday. We all went to MacDonald's</td>
<td>1. Knows convention of writing date before text. 2. Knows how to scrounge literacy models from other sources and can compose her own text from the subject idea, using previous lesson as a starting point. 3. Can compose text from life experience. 4. Can copy text from one medium to another with a high degree of accuracy. 5. Uses punctuation sometimes to end a sentence and line breaks to separate different topics.</td>
</tr>
</tbody>
</table>
### Date | Literacy | Event | Student | Roles/Behaviours | Copying | Writing & Composing | Social Interaction | Environment | Editing Behaviour
---|---|---|---|---|---|---|---|---|---
29 Aug 19 1987 | | 1 Typed her name on the computer independently to retrieve file 2. Typed one sentence from life experience with a little assistance 3. Copied her dictated text. | Michelle typed her name to retrieve her file and informed JC that Adam was sick. She typed this independently, needed a prompt saying out letters for SICK but the rest she knew and typed unaided. She then told JC “My doll is called ‘‘ and murmured indistinctly “Cabbage Patch”. She copied from JC print of MY DOLL IS CALLED then abandoned the attempt to type the doll’s name. She put in spaces but used lower case, continued on the same line and did not use stops. | Copied accurately from JC print to start text. | Typed her name on computer and the date 3. Composed a text from life experience and typed this independently on computer with a little assistance saying out when she asked for help. She composed a text about her doll and copied from printed text but did not complete the sentence. | Michelle told JC “Adam is sick today - I’ll write that.” (SI) She typed the first part independently then asked for help with ‘SICK’. JC said it out with her assistance and prompting “What else sounds like K?” when Michelle typed SIC, she supplied the K herself (DI). She then told JC “My doll is called C……” saying the name indistinctly. She indicated she would like it written down and JC printed MY DOLL IS CALLED, Michelle copied this correctly then abandoned the idea as the name seemed difficult to say. | |
30 Sep 3 1987 | | 1 Typed name and date on computer independently. 2. Typed one sentence from school experience with some assistance. 3. Typed one sentence about her pet with some assistance. | Michelle typed her name to retrieve her file and added the date independently. She told JC about lessons “After lunch we go to PE. It is good fun.” She partly copied from JC printed version of her dictated text and part was typed independently. She copied AFTER LUNCH then completed WEGO TO PE without referring to print, (she noted the missed space and inserted after this but did not correct) and then indicated JC should finish the sentence. She then talked about her dog and typed “TINY TIM IS MY LITTLE DOG” with some assistance sounding out letters for TINY and LITTLE, the rest she typed unaided. She put a comma at the end, possibly intended a stop but hit the next key. | Copied accurately from part of JC printed version of her dictated text to assist in text being composed. | Typed on computer her text about PE lesson. She composed the text but asked for some assistance with spelling and completing typing. Composed a text about her dog and typed independently with some assistance sounding out for words when unsure of spelling. | Michelle told JC “After lunch we go to PE. It is good fun” (SI). JC responded “Are you going to write about that?” Michelle typed the first part then asked JC to complete the sentence. JC typed IT IS GOOD FUN. Michelle then talked about her little dog, she said “Tiny Tim is kept upstairs and he keeps licking me” then typed with some help sounding out letters for TINY and LITTLE. TINY TIM IS MY LITTLE DOG’ |
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<tr>
<td>29 Retrieved file by typing her name. Used spaces but did not use return when she started another sentence. She used lower case and did not use stop.</td>
<td>19887 adam is sick today my doll is called</td>
<td>1. Knows convention of writing date before text. 2. Can compose text from life experience. 3. Can ask relevant questions and responds to prompts by thinking it out for herself when given a clue to put her on track. 4. Can copy with a high degree of accuracy, transferring from one medium to another. 5. Abandons conventions of capitals and stops and separating sentences when concentrating on composing.</td>
</tr>
<tr>
<td>30 Retrieved file by typing her name. Used return to separate topics and typed a comma at the end which was most likely intended to be a stop. She missed two spaces, but noted the first omission. Using operating functions.</td>
<td>19887. AFTER LUNCH WEGO TO PEIT IS GOOD FUN TINY TIM IS MY LITTLE DOG</td>
<td>1. Is familiar with retrieval by typing name. 2. Knows convention of writing date before text. 3. Can compose text from life experience. 4. Can copy from one medium to another with a high degree of accuracy. 5. Knows the function of spacing but occasionally omits. 6.</td>
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<tr>
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<td>31 Oct 29, 1987</td>
<td>1. Typed name on computer and retrieved her file. Then typed the date. 2. Copied text from life experience using invented spelling. Then typed a sentence about her work at school and used temporary spelling, saying out the words slowly, she typed J instead of L and did not correct. She then talked about bees and what they did, using information from previous lesson as a base for text. She typed BEES MAC H' and then asked &quot;How do you spell honey?&quot; Steven came over and wrote TONY saying &quot;It sounds like Tony&quot;. Michelle continued and typed HON but needed help to complete HONEY. She then typed a text about her dog, sounding out dog, she started D for dog then asked for help, but sounding out she got ORA and JC supplied the rest. She typed AND from memory but needed help with BLACK, we sounded this out together and she decided on the letters as we did this. She said &quot;His name is Tiny Tim&quot; and copied the name from previous work on the screen.</td>
<td>Copied accurately from previous work on screen to assist with text being composed.</td>
</tr>
<tr>
<td>32 Nov 5, 1987</td>
<td>1. Typed name and date on computer. 2. Copied text from book on to computer. Michelle retrieved her file and typed the date then selected a book and copied from it. She copied carefully, picking out correct letters and remembering spacing. She pointed to B or D but knew it was wrong and checked before selecting D. She then used 1 for L and did not correct this (she usually does correct this). She stopped before finishing the text and moved on to do something else in class activities.</td>
<td>Copied from book as a source of text. Made only one error.</td>
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<td>31 Retrieved file by typing her name. She used return to go to a new line after the first topic but continued on the same line after that. She used spacing correctly except in the last topic.</td>
<td>29/10/87. MICHELLE IS DOING JOT OF WOC AT SCHOOL BEES MAC HONEY MY DOGS ORANGE AND BLACK TINY TIM</td>
<td>1. Knows convention of writing date before text. 2. Knows how to scrounge literacy models from other sources. 3. Knows letter sounds and can use them to help her spelling. 4. Can compose text from life experience. 5. Can use knowledge from previous lessons as a base for text. 6. Knows she can get help from others. 7. Is trying her own independent invented spelling part of the time and asking for assistance when unsure.</td>
</tr>
<tr>
<td>32 Retrieved file by typing name. Remembered spacing and selected letters carefully. Made one error.</td>
<td>5/11/87. MICHELLE THE PRINCESS PAT WASA PADDIE BOAT ONCE</td>
<td>1. Knows convention of writing date before text. 2. Knows letters and can correct her own errors when she is aware of them. 3. Michelle is not taking risks but relying on copying at this stage. 4. Knows how to scrounge literacy models from other sources.</td>
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| Nov 26, 1987 | 1. Typed her name and date on computer.  
2. Copied from book.  
3. Read out from picture book, telling the stories. | Michelle retrieved her file and typed the date. She then selected a book and asked JC to read out a story that she chose. She then copied the story from the book, used lower case as in the book but omitted all spacing and did not use capitals or punctuation. Michelle then went through the book, showing JC the pictures and telling the story. (She spoke fluently without any trace of a stammer, she stammers when nervous.) Michelle then told JC she would be going to Shellharbour Square and what she would be doing there. She composed a text to write but was disinclined to type herself and asked JC to type it. | Copied from book as subject of text. She made errors, typing b for d and g and omitted spacing, capitals and punctuation. |
| Dec 11, 1987 | 1. Typed name on computer.  
2. Composed text from current life situation and typed with assistance. | Michelle retrieved her file and typed the date. She told about seeing the doctor and not being able to swim because she had to have a hearing test. She allowed the text of the conversation to be typed by JC but she typed her name to start and used lower case. She had an apple she was finishing and pointed out that the juice was running down her arm. She started to type the beginning of the text with her name, again using lower case, she asked for help with the spelling of 'juicy' and needed assistance to compose the text. |                       |
1. Typed name and date on computer. 2. Copied from story book but not as accurately as usual. 3. Composed a text about the coming visit to a supermarket, Shellharbour Square to see Santa Claus. This was from future plans discussed in class.

Michelle retrieved her file and typed the date then showed JC a story in a book and requested JC to read from it. (SI) JC read this out and Michelle copied from the text. She then turned the pages, showing JC pictures and "reading" the story, interpreting the text from pictures and reading some of the known words. Michelle then told about the visit to the supermarket and that she would have a hamburger and chips and see Santa Claus. She asked JC to type this for her.

Michelle told JC that she could not go swimming that day because she had been to see the doctor and was to have a hearing test. (SI) JC encouraged her to start typing this but Michelle typed her name then asked JC to complete it. She then laughed and pointed to the juice from her apple running down her arm. She said "Look its very juicy." (SI) We jointly composed a text and Michelle typed with some assistance and prompting with spelling.
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<tr>
<td>11.11.87</td>
<td>Michelle can't go swimming today because the doctor says she has to have a hearing test.</td>
<td>1. Knows conventions of writing date before text. 2. Can compose text from life experience and observation. 3. Lacked concentration and made errors in copying. 4. Attention was wandering as there were end-of-year activities going on.</td>
</tr>
<tr>
<td>26.11.87</td>
<td>Michelle is going to Shellharbour Square to have a hamburger and chips and see Santa Claus.</td>
<td>1. Knows convention of writing date before text. 2. Knows she can tell a story and transfer it to text. 3. Knows she can tell a story and transfer it to text. 4. Attention was wandering as there were end-of-year activities going on.</td>
</tr>
<tr>
<td>11.11.87</td>
<td>Michelle had a juicy apple. The juice ran down her arm.</td>
<td>1. Knows conventions of writing date before text. 2. Can compose text from life experience and observation. 3. Lacked concentration and made errors in copying. 4. Attention was wandering as there were end-of-year activities going on.</td>
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<td>3 Mar 10, 1988</td>
<td><strong>Typed her name and date in full independently on computer.</strong> 2. Typed one sentence about her dog independently. 3. Typed personal information on computer.</td>
<td>Michelle retrieved her file and copied THURSDAY from the board, saying out the letters as she typed. She typed TEN unaided, copied MARCH from the board and added 1988 unaided. She then decided to write about her dog and typed this with only a little help with the dog's name. She then typed her personal information unaided. She used upper case throughout and separated each item by using return to go to a new line.</td>
</tr>
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</table>
| **35**
1. Retrieved file by typing her name. 2. Used return to format and used spacing correctly. | 10.3.88
THURSDAY TEN MARCH, 1908
TINY TIM PLAYS WITH A BALL
MICHELLE IS 9 | 1. Knows convention of writing date before text and that there are different ways of representing the date. 2. Can compose text from life experience. 3. Knows that the sound of words can help her spelling and uses invented spelling from the sound. 4. Volunteers subjects for text without prompting. 5. Can copy with a high degree of accuracy. 6. Knows how to scrounge literacy models from other sources. |
| **36**
Retrieved file by typing her name. Used spaces and spacing (omitted one space). Used shift key to change to lower case and return to go to new line. | 17. 3. 88.
MICHELLE SEES THE TALL SHIPS
Michelle is on the train | 1. Knows convention of writing date before text. 2. Knows how to scrounge ideas and literacy models from other sources. 3. Can identify words she is searching for and copy with a high degree of accuracy from one medium to another. 4. Can compose text from life experience. 5. Can use observation of the environment to provide ideas for text. 6. Recognises errors and attempts to correct. |
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<td>Mar 24, 1988</td>
<td>1. Typed the date in full on the computer. 2. Typed her name and her friend's name and a sentence about their relationship.</td>
<td>Michelle pointed to the date on the board and said it out. She typed it without further reference to the board. She looked at the screen for help with spelling March but accidentally hit the Y key as well as the H. She realised she had done this and pointed it out to JC but decided not to correct it. She then typed her own name and her friend's name and a sentence about their relationship.</td>
<td>Copied from screen, making a motor error but she was aware of it.</td>
</tr>
<tr>
<td>Apr 14, 1988</td>
<td>1. Typed name and date independently. 2. Typed sentence from life experience.</td>
<td>Michelle retrieved her file and copied the date. She told JC about Faster and the Easter Bunny and eggs. She used return to go to the next line and typed a sentence about Faster independently, only asking for help with the a in 'had'. She used lower case but changed to upper case E when she copied 'Easter' from a poster. She typed the rest unaided and used spacing correctly.</td>
<td>Copied Easter from a chart accurately to assist with text being composed.</td>
</tr>
</tbody>
</table>
1. Typed the date in full on the computer. 2. Typed a sentence about social relationship, used speech for self and asked for some assistance.

Michelle pointed out the date on the board and said it out. She checked on the screen for the spelling of March but hit two keys together and produced MARCYH. She pointed to this knowing it was an error and JC said "Do you want to fix it?". Michelle answered "Leave it". JC asked "We'll fix it another time shall we?" Michelle nodded and proceeded to type her name and 'KIM IS MY' then said out FRIEND, typed FR then asked for help. JC supplied 1 then said out FRIEND again slowly with Michelle who completed the word and then continued 'YES SHE IS' said this out and hesitated. Michelle retrieved her file and typed the date, copying from JC notes (SI) She then talked about the Easter bunny and the Easter eggs she had been given. She typed 'I had (saying out the words but needed help with an ' then looked around the room, located the word 'Easter' on one of the posters and copied from it. She said out egg slowly and typed it unaided. (SI)
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<tr>
<td>37 Retrieved file by typing name Errors in some spaces. Used return to go to new line.</td>
<td>24MARCH 1988 MICHELLE KIM IS MY FRIEND YESSppsE IS</td>
<td>1. Knows conventions of writing date before text and is aware of different ways of expressing the date. 2. Knows how to find required assistance in the environment and to obtain assistance by asking for help. 3. Can recognise errors and knows they can be fixed at another time. 4. Can compose text about abstract concepts friendship.</td>
</tr>
<tr>
<td>38 Retrieved file by typing name Used return, space bar, and shift key appropriately used operating functions</td>
<td>14.4.88 I had an Easter egg</td>
<td>1. Knows conventions of writing date before text. 2. Knows how to look for assistance in the environment and to request help when needed. 3. Can compose text from life experience telling about past events. 4. Can use the sound of words to assist her spelling.</td>
</tr>
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<tr>
<td>39 Apr 28, 1988</td>
<td>1 Typed her name and corrected error. 2. Typed a sentence from life experience.</td>
<td>Michelle retrieved her file and typed the date. She then typed her name but put in an extra letter, said &quot;Oops&quot; and deleted to correct the error and retyped. She started to type LI then picked out the word card and copied from it 'LIKES', she then typed KIM unaided then said out again and typed WE PLA, she knew there was something missing and JC said out the word again with her and helped to decide that Y was the last letter with some prompting.</td>
</tr>
<tr>
<td>40 May 5, 1988</td>
<td>1. Typed name and date on computer. 2. Typed one sentence from life experience.</td>
<td>Michelle retrieved her file and typed the date. She had been with the other students to a school stall where they could buy gifts for Mothers day. She told JC she had bought a bird. She used return to go to the next line and typed her composed text asking for help saying out 'GOT' and 'FOR' she typed the rest unaided.</td>
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<td>Social Interaction</td>
<td>Enviroment</td>
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<td>Typed on computer the date then her sentence from life experience. She used speech for self and a word card selected to help her compose her text.</td>
<td>Michelle retrieved her file and typed her name. She put an extra H in and said 'Oops' and pointed out the error and deleted to correct(SI). She then said 'I like Kim, she is my friend' She typed her text with changes to her spoken words and assistance saying out the last word as she added 'WE PLAY'.</td>
<td>Selected a word card to assist with text being composed.</td>
</tr>
</tbody>
</table>

1. Typed her name and date on the computer. 2. Typed her sentence from life experience with some assistance. She used speech for self and asked for help. She also used approximation. | Michelle retrieved her file and responded 'I got a bird for Mothers Day' when JC asked what she had bought from the stall. (OI) She typed her text, which she changed from the spoken text to 'I got a bird for my mum'. (SI) She said out GOT and asked for help. JC said it out with her slowly and said 'What does it start with?' Michelle typed G and completed it independently. She asked for help with FOR and JC supplied the two end letters after she started the beginning letter but the rest was typed unaided. |
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<td>39 Retrieved file by typing name. Used return to go to the next line. Used spacing correctly and delete key to rectify an error. Use of operating functions.</td>
<td>29.4.88 MICHÉL É LI LIKES KIM. WE PLAY</td>
<td>1. Knows conventions of writing date before text. 2. Recognises errors and knows how to correct by deleting and retying. 3. Knows how to scrounge literacy models from other sources. 4. Recognises words she is looking for and knows where to look for specific words. 5. Can compose text from life experience and make changes to text when transferring to the computer. 6. Can recognise when a familiar word is incomplete.</td>
</tr>
<tr>
<td>40 Retrieved her file by typing her name. Used spaces and return key</td>
<td>5.5.88 I GOT A BID FOR MY MUM</td>
<td>1. Knows conventions of writing date before text. 2. Can compose text from life experience and change the wording when transferring to computer. 3. Knows she can transfer information from spoken words to written text. 4. Knows that the sound of words and letters help with spelling. Can approximate words from sound.</td>
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<tr>
<td><strong>1 May 11, 1988</strong></td>
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<td><strong>2 May 11, 1988</strong></td>
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<tr>
<td>Retrieved her file by typing her name. Used return to go to a new line and used the space key correctly.</td>
<td>11.5.88 MICHELLE IT IS A SUNNY DAY I LIKE THE RAINY DAY</td>
<td>1. Knows conventions of writing date before text. 2. Knows how to use other sources to help her text. 3. Can compose text from abstract thoughts associated with ideas from previous experience. Knows how to extend a topic by adding to it. 4. Can recognize errors and correct by deleting. 5.</td>
</tr>
<tr>
<td>Retrieved file by typing name. Used spaces correctly.</td>
<td>19.5.88 MICHELLE JUMPS IN A PUDDLE IN THE RAIN MEGAN IS MY FRIEND</td>
<td>1. Knows the convention of writing date before text. 2. Can compose text from life experience. 3. Responds to questions and knows how to get help from others and from the environment. 4. Knows the sounds of letters and that sound can help her to spell out words. 5. Knows words are discrete and uses spaces to separate automatically.</td>
</tr>
<tr>
<td>Date</td>
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<td>Student Actions</td>
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<tr>
<td>May 26, 1988</td>
<td>Michelle retrieved her file and copied the date. She then typed her name, made an error, said &quot;Oops&quot; and corrected the letter. She copied MEGAN from a wall chart, then typed EMMA independently. 2. Typed a sentence about one of them on computer.</td>
<td>Copied date. Copied from wall chart to assist text being composed. 1. Typed name and date on computer. 2. Typed sentence about one of them on computer.</td>
</tr>
<tr>
<td>Jun 2, 1988</td>
<td>Michelle retrieved her file and typed the date and her own name. She said &quot;My name first&quot;, and called Megan over to show her her name on the screen then copied MEGAN from the screen above. Megan came over and recognised and said out her name. Michelle continued typing, missed a space, said &quot;Oops&quot; and corrected by deleting, and inserting space. She then typed &quot;TONY IS HERE TODAY&quot; after reading her text from the previous week on the screen above. She typed TONY IS unaided, sounded out H then copied the rest of hero from the screen. She said out D and completed DAY independently.</td>
<td>Copied accurately from screen above to assist text being composed. 1. Typed her name and date on computer. 2. Typed sentence related to previous weeks text, an ongoing theme. Used speech for self.</td>
</tr>
<tr>
<td>Interaction with Computer</td>
<td>Product of Event</td>
<td>Inferences Drawn</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>------------------</td>
</tr>
<tr>
<td>Retrieved file by typing name. Used spacing but no punctuation and did not use shift key.</td>
<td>26.5.88 michelle megan emma tony is not here to day</td>
<td>1. Knows conventions of writing date before text. 2. Knows discreteness of words. 3. Can compose text from life experience and observation. 4. Knows how to scrounge help from different sources. 5. Recognises errors and knows how to correct. 6.</td>
</tr>
</tbody>
</table>

1. Retrieved file by typing name. Used delete to correct and inserted space. Used spacing correctly. | 26.5.88 MICHELLE MEGAN EMMA TONY IS HERE TODAY | 1. Knows conventions of writing date before text. 2. Knows how to scrounge assistance from environment. 3. Can read back from previous work and compose related text. 4. Can recognise errors and correct. 5. Knows sounds can help with spelling. |
<table>
<thead>
<tr>
<th>Date</th>
<th>Literacy Event</th>
<th>Student Roles/Behaviours in Event</th>
<th>Copying</th>
<th>Writing &amp; Composing</th>
<th>Social Interaction</th>
<th>Editing Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Jun 16, 1988</td>
<td>1. Typed her name on the computer. 2. Typed sentence from life experience.</td>
<td>Michelle retrieved her file and typed the date. She then typed her name independently and said “Emma is my friend now.” She may have noticed her previous text as she moved to the end of the file. She typed unaided, left a double space after her own name but continued on the same line. She approximated FRIEND without asking for assistance and typed NSO for NOW, probably hit the S key accidentally instead of W and added O afterwards.</td>
<td>Copied date from JC notes.</td>
<td>1. Typed name on computer independently. 2. Composed and typed a text related to previous text “Emma is my friend now” giving an update of events. She used approximation for ‘friend’ and ‘now’ but made a typing error.</td>
<td>Michelle retrieved her file and typed the date, copying from JC notes. (SI) She typed her own name independently then said “Emma is my friend now” and proceeded to type this unaided. (SI)</td>
<td>May have noticed her previous text and used as source for new text.</td>
</tr>
<tr>
<td>4 Jun 23, 1988</td>
<td>1. Typed name and date on computer and read out as “Today is the 23rd of June”. 2. Read out previous work from screen and typed the same names and copied ‘FRIEND’ sounding out the letters as she did this.</td>
<td>Michelle retrieved her file and typed the date as 23.6.88. She read it out as “Today is the 23rd of June.” She pointed to the screen and read out “MEGAN EMMA TONY,” she typed these names independently putting spaces between, she said “O” as she typed the second letter in TONY then copied ‘FRIEND’ from the screen above, using two separate pieces of previous work to provide a new text.</td>
<td>Copied accurately from screen to assist with text being composed.</td>
<td>1. Typed her name and the date and translated the written abbreviation into the full form of the date verbally. 2. Typed her own name and those of friends, using previous texts as source of ideas and added ‘FRIEND’ which she copied from the screen to indicate relationships. She used speech for self to assist her typing.</td>
<td>Michelle retrieved her file and typed the date. She read out as “Today is the 23rd June” from the abbreviated 23.6.88. She pointed to the screen and read out names of her friends. She then typed these unaided, said “Emma” as she typed and “O” as she typed Tony as she decided on the second letter then copied ‘FRIEND’ from the screen above. JC said “You are all friends now.” Michelle said “Yes all my friends.”</td>
<td>Read from screen and used previous topics as source of text. (SD)</td>
</tr>
<tr>
<td>Interaction with Computer</td>
<td>Product of Event</td>
<td>Inferences Drawn</td>
<td></td>
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<tr>
<td>45</td>
<td>16.6.88</td>
<td>1. Knows convention of writing date before text. 2. Knows she can approximate spelling from the sound of the word. 3. Can compose text from life experience and continue on from previous work with the same theme.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>MICHELE EMMA IS MY FRIEND NSO</td>
<td></td>
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</tbody>
</table>

<p>| 46                        | 23.6.88          | 1. Knows convention of writing date before text and that it represents the day, month and year. 2. Can read back from screen and use material as source for new text. 3. Knows she can use sound of words to help with spelling. |
|                           | MICHELLE MEGAN EMMA TONY FRIEND |                   |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>Behaviour/code</th>
<th>Typing</th>
<th>Literacy Event</th>
<th>Inferences</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 16, 1985</td>
<td>MF Showed drawing of his sister, and said &quot;Mark's sis&quot; giving it an oral label.</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Labelled the drawing orally, use of symbolic representation.</td>
<td>Understands that marks on paper can represent meaning - can tell a story.</td>
<td>1: Symbolic representation 2: Oral labelling</td>
</tr>
<tr>
<td>Jul 17, 1985</td>
<td>MF Wrote his name and wrote b c p and numbers 1 to 4, had difficulty with 5 but wrote 6 &amp; 7 easily.</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>MF wrote his name as 'Makk Fokk', used capitals and space between, wrote left to right, kept fairly level. He missed R out of his name, used capitals and space between. He reversed c.</td>
<td>He knew what writing was and that his name could be represented by print, he had internalised it from previous demonstrations. He used some conventions : capitals, spaces, wrote L-R in line and reasonably well, tailing away a little.</td>
<td>1: Specific representation of name (meaning) 2b: Conventions - capitals spaces 3b: Random letters</td>
</tr>
<tr>
<td>Jul 23, 1985</td>
<td>MF Typing on computer, his name, tried out other letters and function keys. He discovered the delete key and deleted everything. Tried ESC and could not understand why he could no longer type.</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relating keyboard letters to printed letters and to the screen letters.</td>
<td>He made the link between different media : written symbols, keyboard and screen. He also tried to operate other functions and realised he could delete with the delete key.</td>
<td>1e: Connection keyboard/screen 1d: Delete 1c: Escape</td>
</tr>
<tr>
<td>Jul 30, 1985</td>
<td>MF Packed at keys carefully noting what came on screen. Remembered delete and cleared all but his name. Then typed alphabet saying out letters.</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Discovered that all the letters of the alphabet are on the keyboard and named them in order. Showed his knowledge of letters and letter names.</td>
<td>He could recognise and name from memory all letters of the alphabet. He knew upper case letters as well as the lower case usually used in class printing. The request for assistance in locating w y may have been due to slowing effort.</td>
<td>1e: Connection keyboard/screen 1d: Delete 1c: Escape</td>
</tr>
<tr>
<td>Aug 13, 1985</td>
<td>MF Packed at keys carefully watching the screen. He asked Patrina for help in typing her name</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gaining confidence in spelling, 'names of others and knowing to ask the person concerned when unsure.</td>
<td>He realised that he could write about other children , not only himself, and made the link between his knowledge and their knowledge.</td>
<td>1e: Watched screen when typing 2d: Including friends in story 4e: Asking for peer help</td>
</tr>
<tr>
<td>Sep 23, 1985</td>
<td>MF Typed his name then dictated 'Happy birthday Mark' story. He had no difficulty communicating.</td>
<td></td>
<td>Literacy Event</td>
<td>Inferences</td>
<td>Categories</td>
</tr>
</tbody>
</table>
|            |                |        | He knows that his oral story can be represented on the computer and read back again. | He recognises the link between speech and writing and printed or typed representation of words. | 4k: Typed name from memory 2j: Read back his own meaning to me 3c: Accessing text 3e: Linkage with oral story
APPENDIX 2

INTERVIEW DATA
Dear

I am writing to seek your permission to include your child in a special project. I am interested in working with the children in the integration class on a computer. The aim is to see if using a computer can help the children in learning to read and write. The project was started last year as a part of my studies at Wollongong University.

This year, on the two days the class is at School, I am again proposing to take a computer into the classroom and work in with the teacher in language learning activities.

Last year the children were all very interested and keen to use the computer, they tried out a few things on the keyboard and started writing activities. Newcomers to the class will not be at a disadvantage and will soon learn to use the keyboard.

I hope that you will agree to this request so that the whole class can be included. At a later date I would like to meet with you to discuss any developments you may notice. I would also like to thank those parents who agreed to allow their child to take part last year.

I have talked with Mr Paul, Principal of School and with Ms Sue-E, the class teacher about the possibility of continuing the study project with the class. They are both in favour of this.

Please return the signed permission note to Mr Paul School if you are willing to allow your child to take part in this project. If you have any major concerns, please feel free to contact me or as we are all very positive about the opportunities this project can offer the children.

Yours,

Jane Cook.

PERMISSION

I agree to allow my child ........................................... to take part in the study project - suing a computer in the classroom to aid reading and writing - with Mrs Jane Cook of the University of Wollongong. It is an activity approved by the school.

PARENTS SIGNATURE: ...........................................
Interview proposal:
Proposed Format

Students:

I would like you to tell me about writing and using the computer, do you think we can talk about that to-day?

Writing Probes

*Will you show me some of your writing? (Look through, ask- what does that say? if pictures see if related to any writing.)

*Tell me when do you write.

*Tell me what kinds of things your teacher does to help. Why do you think your teacher likes you to write?

*Tell me if Mummy/Daddy/Sister/Brother help you if you write at home, what do they do to help you?

* Tell me what you do when you are writing.
* Tell me how you start to write a story.
* Can you tell me how you think of what to write?
* Can you tell me what you write about ... can you tell me how you know what to write?

*Tell me what kinds of things you like to write about, how do you get ideas.

* When you write a story, what is it for - (do you think about what you are writing and who you are writing for?... is it a message?)

* Tell me about how you write with the computer.
* Now tell me about writing with a pencil.

* Can you tell me if you think that when you are writing with the computer you do the same things as when you use a pencil? Can you tell me what is different? Why?

* Would you tell me if there are some things you do when you would rather use the pencil- when, what for, why?
Can you tell me what you think about using the computer for writing?

Student responses were not able to be formally obtained but a few comments are recorded here.

**Mark**
Likes to use the computer better than pencil. He likes to look at a book and copy from a book.
When writing - "Think about words and write story and show Mum".

**Ricky**
Likes the computer, he writes names and Angies' birthday. He uses a pencil the same to write.

**Melissa**
Always likes to use the computer to write stories. She thinks about things she has been doing to write about.

**Michelle**
Likes the computer to write, she has one at home and she writes stories about her dog.

**Steven**
Steven likes the computer because he can write longer stories.

**Kylee**
Likes to use the computer it is good.
Teacher Interview Format

Focus:

* I need to get some background information to try to fit the kinds of things I am doing into the class context and into your concept of how the students learn literacy-language skills. I would like you to tell me what you believe about literacy learning and what you think are successful teaching methods. But first I'd like you to tell me where you did your training and a little bit about it.

* What did you learn about teaching reading and writing, would you give me a brief run down of the methods you were taught in college? Have you developed other ways in your teaching experience since then?

* Have you done any further study or in-service training? Do you like to keep up with developments by independent reading/on literacy- on teaching exceptional children- on education in general?

* Tell me how you teach reading/writing in this class, what do you do each day that you consider to be part of literacy learning.

* I believe you have taught general primary classes, is it different teaching these children? Tell me about it.

* Tell me what you believe about the way your students learn to read and write and communicate?

* Tell me what you usually do in the class through the week. Could I have a copy of your program so that I can see how you arrange
language lessons, and could you tell me the kinds of resources you use? I have seen your books and use of television programs and tapes - are there any other methods you use? Think of the best reader/writer in the class, is his mode of operation different to that of students in general primary classes? Can you tell me how it is different?

*Tell me what you did in language yesterday.

*What do you regard as indicators or signs of progress in development of language skills? How do you evaluate?

*Tell me how you think the children respond to using the computer?

*What kind of an impact do you believe it has, do they talk about using the computer, do they plan in any way for their time on the computer? -To write about news or excursions or class activities?

*Do they relate their class language-learning activities to their use of the computer for writing?

*Do you think there has been any impact of the computer on your program, can you see any advantages/disadvantages coming out of it?

*Do you have any concerns about the students using the computer?

*Can you tell me what has been the individual/general student response to the computer and if there has been any change in their mode of operation in the language-learning, reading/writing in the general class situation?
Teacher Interview 1 (MD)
November 1987

I need to get some background information to try to fit the kinds of things I am doing into the class context and into your concept of how the students learn literacy-language skills. I would like you to tell me what you believe about literacy learning and what you think are successful teaching methods. But first I'd like you to tell me where you did your training and a little bit about it.

Trained at Waverley College, Kindergarten Training College, Sydney, Early Childhood training. Dip Ed.

Joined the department of Education, taught for five years in infants classes then resigned because of family commitments. After raising family entered casual teaching system for ten years. During the first five years of service had taught in two schools in which a set program for language was followed. On returning as a casual encountered a big change in methods of teaching language/literacy from the first year back to the time when she left to come to the present school. Visiting language experts were brought in, there was a shift to process writing and a total approach to the teaching of literacy. The children relating all units to the curriculum area, a variety of approaches all drawn in together - sounds pictures - library work - free choice of writing

Spent the first five of the ten (casual) years in the pre-school area, teaching parents and children English, helping the children to settle into school and the parents to accept the system (ESL). When funding as a disadvantaged school ceased remained as a casual teacher for a further two years then obtained relief from face to face teaching for four terms, during which time concentrated on music and computers and looked at the K-6 curriculum (4-6).

*What did you learn about teaching reading and writing, would you give me a brief run down of the methods you were taught in college? Have you developed other ways in your teaching experience since then?

At Waverley, the students undertook two practice teaching sessions (Primary). In the language area a set program was followed using sets of readers - comprehension skills taught and dictation etc
following a rigid format (sometimes uses these methods as 
extension work for M&M).

Quite definitely has developed a different approach to the teaching 
of literacy since early training. Experience over the years has led to 
the use of many and varied approaches, blends in the old with the 
new if it seems appropriate for the child. Has a more open approach 
and tries whatever seems to work to build literacy skills. Uses 
many aids, books, television, story telling and discussion- some sets 
of materials which include cards and simple words- pictures.

* Have you done any further study or in-service training? Do you 
like to keep up with developments by independent reading /on 
literacy- on teaching exceptional children- on education in general?

Went back to studies, completing a conversion course majoring in 
Special Education, thus gained three year status. Has also 
undertaken in-service on music - Breakthrough to Literacy - 
Reading in Colour and also keeps up to-date by personal reading- of 
staff materials, new publications from Ashton Scholastic/ Library. 
Interested in the Big Book area. Has also looked in depth at the 
teaching of 'gifted' children , having encountered one case 
personally - is interested in the overall area of Special Education

*Tell me how you teach reading/writing in this class, what do you 
do each day that you consider to be part of literacy learning.

Makes use of sounds, symbols, blending in with the work of the 
communications specialist in the school. Uses Maketon , a repetitive 
reading program using the same sentence line but gradually 
introducing different words e.g. The boy jumps. The boy runs. The 
boy hops. Also makes use of pictures for those students who cannot 
recognise words so drawing these children into recognising the 
same sentence runs but using pictures to get to understanding. 
Process writing with invented spelling is used - talking about 
pictures, blending signing and reading . Games are also used as a 
vehicle to encourage communication and understanding and extend 
vocabulary. 
Television, audio-tapes, acting out stories and discussing what 
happens
*I believe you have taught general primary classes, is it different teaching these children? Tell me about it.

There is a big difference, a need to accept what is present across a wide range of abilities in the students. Coping with a group of twelve (a large group for special classes). One of the main differences is the need to exercise discipline especially because of integration it is necessary for the students to be able to behave in way that brings them up to a mixable - acceptable standard. This is a burden at times when things don't go well but is worthwhile when all goes well and a feeling of achievement is gained. Sees many frustrations at times but activities jointly entered into enable the children to socialise in the mainstream. One of the students M is working very well in one of the normal classes, in a well run class where integration is practised (in the link school). However, the teacher has reservations about this boy, when next year he returns to the regular school system. She feels that he may not cope with life in an OA class which will be entirely different to his previous experience.

Feels that these students learn in the same way as 'normal' children, they do the same kinds of things and make the same responses in learning situations but at a slower rate. They cannot be moved along by age groupings, may progress for a while and then remain on a level until ready to move on. M is process writing at first class level, does things the same as would be done in a normal first class, he is probably not as consistent (he is two years older than a general first class).

* Tell me what you believe about the way your students learn to read and write and communicate?

There is a transition in the first instance from scribbling to a disciplined or controlled way of attempting to write. Actually presenting work which has meaning, it may not be an actual representation but they can tell you what they intend it to represent and can relate what they mean.

They watch television and talk about what happens, audio cassettes are played and stories discussed - what happened- what do you think will happen? A kit called Smile is used a great deal, this has cassettes, cards with simple pictures used to tell a story. They use mime, poetry, news telling, a segment using big books where they all read through together and retell the story.
*Tell me what you usually do in the class through the week. Could I have a copy of your program so that I can see how you arrange language lessons, and could you tell me the kinds of resources you use? I have seen your books and use of television programs and tapes - are there any other methods you use? Think of the best reader/writer in the class, is his mode of operation different to that of students in general primary classes? Can you tell me how it is different?

*Tell me what you did in language yesterday.
News - talked about silk worms, they have a collection of them in a box in class.
Watched Playschool and talked about what they did on the program.
Process writing with kindergarten
Story
Reading Music through expression.
A story acted out.

*What do you regard as indicators or signs of progress in development of language skills? How do you evaluate?
Response:

Indicators- when a child will sit and listen to a story followed by talking about the story and remembering, perhaps indicated by bringing something from home which is related to the story. This shows that the child is talking at home about school activities. A further indication is the ability to recognise things related to the story in another environment - the library for example. Relating words to units of work or activities, for example Spring is linked to caterpillars, when words are picked out and related back to previous experience, then this indicates a grasp of what is being learned.

Evaluation is based on a number of observations by the teacher. A check list is used to indicate achievements - colour recognition - shapes - tasks mastered. There are one to one sessions during which the teacher spends time with each student to determine progress and evaluate the stage reached. For example she takes notes on how the students have interpreted a story, if they can discuss what happened in the story. At the beginning reading stage this helps to determine how much help is needed, e.g. some of the students can read some words some need pictures to help them
follow the story or acting out. All the children can then join in, if those who need pictures are assisted they can all follow what is happening.

Beginning readers and other books are taken home (breakthrough etc. only the Yellow Spot is used except with the two most advanced students) rewards for work in the form of stamps are given (parents can do this and report to the teacher on which books have been read, keeping track and recording the place reached in the book).

*Tell me how you think the children respond to using the computer?
Response:

Very keen, they are all interested and thoroughly enjoy using the computer. It has been introduced in a way that encourages them to try things without any expectations to perform to a level. It is non-threatening and is accepted as being fun and is perceived to be a good thing to do.

*What kind of an impact do you believe it has, do they talk about using the computer, do they plan in any way for their time on the computer? -To write about news or excursions or class activities?
Response:

Yes, sometimes one will say "I wonder if Mrs Cook will give me a turn on the computer today" especially if they have already been to the school computer then " that will make two turns ". One or two will plan what they will do - write about news or something that happened in class. (Mel and Mark in particular). Generally they are aware which day is the day for the computer.
Young A is very impressionable - television dramas catch his imagination - he needs to be brought back to reality he will talk about wildly unlikely happenings.

*Do they relate their class language-learning activities to their use of the computer for writing?
Response:

Yes, when finding sounds they will talk about using the computer to write it down.
*Do you think there has been any impact of the computer on your program, can you see any advantages/disadvantages coming out of it?
Response:

Yes, it fits in very well with the program and can be brought into the overall class activities - some are especially prepared to link what they do in class to using the computer. The school computer is used in a limited way as the teacher cannot leave the class for any length of time, the aid takes two of the students to use the computer. She feels this is not very satisfactory as she would like to be able to be present when they are using the computer.

*Do you have any concerns about the students using the computer for literacy learning?
Response:

No, the way the students have responded is very positive, and the teacher feels that it can only help in encouraging the use of language, in letter recognition and word formation.

*Can you tell me what has been the individual/general student response to the computer and if there has been any change in their mode of operation in the language-learning, reading/writing in the general class situation?
Teacher Interview 2 (IT)
July, 1988

Trained at Wollongong taking Special education as an elective specialisation for three years, did her third year as an external student. During her ten? years of service has always taught in either ESL or special education. During training the teaching aspects of reading and writing were separate from other parts of the course and could not be considered to be a part of a whole approach to literacy learning.

The teacher undertakes personal reading of departmental and other publications as part of keeping up with developments and is considering upgrading her qualifications as soon as family commitments permit.

The teacher now considers literacy/language learning to part of all classroom activities. Believes that maths, music, news, all employ and foster communication skills. She does not employ such strategies as learning set pieces or groupings of words 'AT' words etc as she considers that language is an integral part of all activities and the base of every learning process. The language used in the day to day activities of the class promotes better understanding, extends vocabularies and extends the childrens' capacities to relate one activity to another. Literacy learning is definitely viewed as part all classroom and external events such as library sessions where book reading is part of the program, dance where expression and communication of ideas is important.

At the beginning of the year as part of a "getting to know" the class they did a unit on "ME" which involved language -social studies - maths- art work - body shape- providing a whole system of study which linked all their activities and promoted interpersonal communication.

The Maketon symbol/sign system is used extensively, a combination of pictorial, print and signing communication. The teacher believes that whilst these students learn in the same ways as other children, going through the same activities in language acquisition, the presentation for learning is different. As for example the use of Maketon is a concentration of visual and sound information which encourages the child to communicate in whatever manner they can and enables them to connect the
pictures to the spoken or signed words. Some of the students have communication problems but all can be assisted in one way or another with Maketon and their responses are the same as other students when they learn something new, they like to show off their achievements and repeat activities and appreciate approval of good work.

Various activities and resources are used but all lessons are related to language. They watch Playschool, listen to records and tapes, read books as a group, have discussions about the programs and stories. They sometimes act out their readings. The news sessions are a vehicle for self expression. Each week there is a list of weekend news, children giving news each day, this draws on drama and acting as the children will demonstrate and act out their stories.

Yesterday language lessons started with words such as 'small, smaller, smallest' used as a pre-maths activity which was then related to separating objects into categories.

The teacher considers indicators of progress in language skills to be the use of descriptive language, using adjectives, adverbs etc (not just repeating words), putting sentences together, extending vocabulary and comprehending more of what is said.

She feels that the children's response to the use of the computer is very positive, they are very keen and very happy to be able to have a turn. They ask "Is Mrs Cook coming " on the day that I am due and are very disappointed if for any reason I do not go. They will say "This is computer day ", it has definitely become a part of their normal school week and is accepted as an integral part of class activities.

In considering the impact of the computer on the class, she feels that it ties in very well with their routine. At first, at the beginning of the year she thought it was disruptive as the children were so keen to have a turn they would keep asking if they could be next. However after the first week or two they settled down more and accepted that if they went on with their work they would get a turn on the computer. She feels that it correlates very well with their whole language learning, reinforcing their reading and writing activities and linking with homework too. As the year has progressed she has observed that their main words are being put into simple sentences on the computer linking what they do in class across from writing on the board, and on paper to the computer.
They are using extra books, they will get books to read and copy on the computer. The itinerant teacher for the deaf also uses action-repetition and Maketion symbols which also ties in with other work and is reinforced again with the computer. Certainly she feels that the computer holds their interest and is part of the class setting.

The teacher feels that there are no concerns about the students using the computer, it provides them with an opportunity which otherwise they would not have as it is too difficult to organise their use of the school computers. She has no negative response to the activity and feels that they are transferring the computer activity back into the class in a reinforcement of their whole language environment. They will call her over to see what they have done and read back some of their efforts.

The time spent in an integration setting (two days per week) are valued as the children mix with other students, are provided with role models and learn social skills. In addition combined undertakings such as the assembling of a town model where each child contributed to the plan of houses and streets provide opportunities for co-operation and mutual support for efforts, for communication and learning experiences. These group activities are important. Learning with the other children they learn to conform to the host school's expectations of behaviour whilst participating in combined lessons.
Member Check - Teacher

1. Learning Climate
The learning climate for language is adaptable, encompassing the wide range of abilities of all the students and drawing all of them into co-operative efforts. Those who cannot read at all are encouraged to follow stories through pictures and 'acting out', signing is used by all in some activities.

2. Context - what are the students doing?
The students are learning at their own pace, they are extended but not pushed beyond their limit in any area.

3. What is the model of language learning?
Relevant aspects of different approaches are used but the language approach is a holistic one, drawing in all facets of communication and utilising as varied means as possible to promote linkage of what is learned in one context to what is observed in another. Games, television, audio tapes, acting out and discussing stories which have been read or listened to. Discussion of what happens in the story is important in assessing the understanding and retention of what has been done.
Process writing is an important part of the language-learning environment. Drawings are done independently, the story may also be written, using invented spelling. The child 'tells' what the 'story' is, the teacher 'writes' the story. Those who are able, write with invented spelling, all the students participate to the level of their ability.

4. Students learn through interaction.
There is great emphasis on interaction and co-operation in this classroom. The more able students are models for their less able peers. There is a great deal of group involvement in activities and an expectation that all will participate.

5. What are the differences in this class to a regular class?
The difference is noticeable.
The main difference is the wide range of abilities and the need to cater for all levels in the one group. The need to exercise discipline especially in relation to the integration with primary classes. It is necessary for the students to behave in ways that are acceptable in the integration situation so that the children are able to socialise in the regular school environment.
Record of Interview

Principal 1.

* Tell me about your school policy on language/literacy learning- do you have a general system that you follow?

Response:
- 1. In regard to policy the first point to be made is the recognition of language as of vital importance to the students.
- 2. Use whatever means is effective in assisting communication. With more able students it is more important to promote progress in the area of language/literacy, but always in a self-fulfilling way, non-threatening, giving encouragement but not pressing the need for achievement beyond their abilities. Considering all areas of communication, of which oral communication is a major priority (or an alternative - signing, symbols) a distinction is made between receptive and expressive communication. Receptive tends to precede expressive, if a student is advancing in receptive communication, then they move on to - reading, writing etc.
Reading: is paced to the student, in a way that avoids placing them in a failure situation- success is important. Support is given by giving assistance as needed, in a structured way, allowing the student to extend to the fullest of their ability at that time . For writing the same approach is adopted.
Considering the wide range of students in the school, covering early stages of development, pre-learning/ early learning, as the students move towards independence in these early stages there is a need to recognise a balance between development and achievement. There is a need to avoid concentrating solely on a functional approach - "what do they really need' - looking at imperatives of achievement, there should be a balance with fulfilment - doing for the sake of doing- doing their own thing- without pressures.
They (school) all work with an awareness of the "K-12" approach, and for all students able to , this is followed as far as possible but without pressure to achieve at certain ages. Taking the long term view, the staff are prepared to allow students to achieve a plateau and remain there, without attempting to accelerate -into failure. When ready they will take up, possibly in a new way, trying different things. Readiness: after progress and consolidating of that progress then readiness to advance is observed and followed by further progress. There are some exceptions. Fundamentally, the
work experience in the school follows no one scheme. Progress sometimes diminishes then picks up in other ways but pressure is avoided.

*Tell me about what you regard as a sound base for language and literacy learning for your students?
Response:
A combination of language experiences and some sort of structured approach to acquisition of skills. Different children need different approaches. The teacher is the guide, knows the children and their responses. The teacher has a key role, but involves other professionals (speech therapist etc and senior staff) in consultation to test observations and determine the most effective approach. The teacher is the starting base but receives support and advice from colleagues in structuring language and literacy learning.

*I would like you to tell me your thoughts about the way your students should be learning about reading/writing/language. Do you believe they should be doing the same things as students in general classes?
Response:
The starting point should be to match up to the ordinary school- for the more able students. The aim is to 'normalise' by degree, if the students are to enter the regular school system then this should be at a rate which is not stressful. Decisions should be made based on degree of disability and on individual capabilities and there may be a need for an independent decision for different programs for some students.
For the profoundly disabled - those without language, literacy and oracy and communication in general have an underlying component of cognition. Stimulate cognitive development and skills for cognition. How do we distinguish between development of communication at the pre-pre reading and the pre-pre language level. Where there is no reading, discrimination of a picture or object or sign - is it pre-reading communication or cognition? At that level, it is semantic.

*Can you tell me about the way that computers are being used in the school curriculum.
Response:
There are two computers in the school, these are used for language, communication, literacy, numeracy and computer awareness. Process writing is supported by the computer use.

*Do you believe that computers can be of value to the students in language and literacy.

Response:

Yes, they are of value to different degrees. An important factor affecting the value is the ability of the staff to use them and their confidence in undertaking to work with computers. If staff are experienced and able to use to full advantage then the value is greatly enhanced.

*How do you think the computer use will be a benefit/disadvantage in literacy learning?

Response:

The only disadvantages perceived are 1) if false expectations are aroused and if students are pushed beyond their capabilities by being expected to fulfil those expectations. 2) The use of poor programs.

Advantages have been observed, sometimes startling for some students who have displayed abilities to persist with programs, maintain attention- greatly expands attention for some. Some students provided surprises in their tenacity in responding so well to the computer, some who were not expected to do much showed very clearly that they could do many things which previously would not have been expected of them. The development of skills and advances in learning and greatly increased motivation to learn is very evident. The interest for students has been sustained, it has not been just an initial interest. The advantages gained in process writing have been particularly pleasing, students are stimulated by using the computer for writing. Telememo is used and this has encouraged students to communicate- extends their horizons by allowing communication with other students in other schools.
Stressed the importance of staff training which is considered to be the key to how the program operates. Some staff members are very keen and have maintained that interest, some lose the impetus after a while and some are not very interested in competing for the limited resources. There needs to be forward planning for using the computers. The committed staff provide a core which will remain the hub of developments, as new staff come in, they will train them and provide a base for the next stage of the program.

Although resources are limited (2 computers) feels that this may be preferable to too easy access as it stimulates initiatives from staff who become adept at overcoming problems and who plan for the best use of the facilities.

*Tell me what expectations do you have from their use of the computer?

Response:

This is an unknown area as yet, the main impact is with the more able students, the infants, primary and early high school. The school leaving group will not show the effects, need a longer time in operation before the results will show at that level. The long-term outcome is not predictable as yet, but he could predict that there would be no fear, no worries about using computers. The question is how far will the computer use program have assisted in the learning process. He hoped that there would be programs coming on stream that would assist in development of the program and noted that the learning that had been gained from the programs already in use persisted, once gained it was maintained. Considers there is a lot of potential to cater for a wide range of needs.

*Do you think that some students can benefit more than others, can you tell me why?

Response:

The more able benefit more at this stage but the question remains open for more advantage and potential for the more severely disabled. If they try to discover how to reach those not responding at present through computer peripherals. It is fine for the most capable to demonstrate the potential now, this can then be
emulated for others later - for all, there should be no holding off no matter how severe the disability if they can respond to the stimulus of the computer.

*Do you see it as facilitating skills which will be of use as they progress through the school?

This was addressed earlier and the feeling is that the younger students will show the effects as they progress through the school having gained skills from their use of the computer.

*What are your views on evaluating language/literacy development for your students? Tell me about the ways your staff evaluate their students.

In the computer program currently operating there is not enough structure to warrant evaluation, it is still at the discovery stage - a time factor is needed to allow for consolidation. There is good communication between the people involved, dialogue and consultation between teachers concerning their computer based programs. There is a desire to avoid any pressure which may kill spontaneity in the computer initiatives.

Evaluation of language/literacy is established and operates through Curriculum Committees. Curriculum is reviewed on a regular basis (not every year) achievements are assessed and this leads to a number of changes.

From the time of the current Principals arrival five years ago the school had moved from a rigid model for literacy using Distar for language and literacy development to a wide ranging program encompassing many approaches to literacy. They look at verbal and non-verbal (signing and symbols) as a whole using aspects of a whole range of language/reading programs, seeking to record individual progress and match new programs and developments according to the needs of the students. Process writing has become the accepted mode for writing but other approaches and systems are also employed where they seem appropriate. Some staff even pull out the old Distar materials at times and use some parts but in a way that suits the present approach to literacy.
Staff regularly evaluate all readers across the school to see where they are, to establish the stage of development of literacy skills reached. They are now looking at language level of severely disabled students working towards improving methods of contact and communication.

*Do you see any impact on the teaching staff, on the students, that you relate to access to the computer?

Response:

Staff have now gone through the first phase of establishment of the computer program and are now consolidating. They will probably go in deeper now that there is a base of people who have gained expertise to take them forward. What is needed now is surge of funding to give impetus to development and people with drive to move the system forward to the second stage. They are looking to expand the program. If funding becomes available there are two options, 1.) to have a computer room with a bank of machines which could then be accessed by students outside of their class setting or 2.) the preferred option of a computer shared between two classrooms which would allow in-class access to both classes in arranged time slots. This would require planning and usage would determine where the best placement would be for the maximum utilisation of resources. One approach would be to start up with two computers available to those classes already prepared and ready to go- with teacher familiar with computer usage and organised to build computer use in to class program. Then the next group would prepare and train up to be ready to take up the computer use. The idea would be to make the best use of the computers for a dual purpose - to train staff in computing skills and usage and to prepare the children for computer learning which will be encountered more as progression occurs. If this progressive approach is not satisfactory then they could go back to the idea of a computer room with a key person providing the expert guidance needed to staff and students. There are other possibilities but experience will guide the development of the program.

*What would you like to see happen as a result of this research?

There are already perceived outcomes which have assisted the school in moving into computer usage, in making choices in setting up a program. The introduction to a wide range of software during
the study has guided their choice of software appropriate to some of their needs. This saved a great deal of time as trials of software had already been made with the students. The children I have worked with have progressed further than would otherwise have been the case due to commitment, experience, ability and approach. The acceptance gained throughout the school - by teachers and students has been accomplished in a way that makes it look easy, but it should be acknowledged that there are no easy ways to this, acceptance has to be earned. It should be mentioned that the seeds sown for the development of computer use, the ideas put forward and the involvement of people in the ideas is an influence which is generally unrecognised but is shown in the way I have been accepted in the school.

*What do you think might be possible outcomes?
Member Check- Principal

Perceptions:

Views language as of vital importance to students, believes that students should be encouraged to progress in communication, starting with receptive and moving on to expressive when the student is ready. Always at the students pace, avoiding the stresses of a functional approach. Self-fulfilment in a non-threatening environment in which the student can succeed and is not pushed beyond the level of competence is the general aim and policy in the school. When progress is made, then consolidation is important prior to further advancement - when the student is ready. The staff are supportive in a structured way, giving assistance as needed and allowing the student to extend to the limits of their ability.

Language/Literacy Learning Approach

The approach to language learning is widely defined, taking in a variety of methods, always geared to the individual students needs. A combination of language experience and some sort of structured approach to skills acquisition. There is an awareness amongst the staff of the "K-12" approach and the desirability of students following the general path as far as possible, but without pressure to achieve at a pre-determined age level. The teacher is a key person in determining the program followed, the knowledge of individual students progress and abilities is best assessed by the class teacher. However, other professionals are also involved and consulted, speech therapist, senior staff, physiotherapist and others may have input into the students learning program.

Beliefs in regard to general class/special class relativities

The aim is to 'normalise' by degree, the more able students should be able to match general class students if they are to enter the regular school system.
Record of Interview Principal 2.
(Informal)

The principal expressed interest in the study project and support for development of the use of the computers in the school. He was promoting computers as a means of communication within the school and with other schools, through the use of modems.

He had purchased BBC computers for the basic learning section which operated on switches. These were intended to provide sensory stimulation for the physically disabled using single switch programs for computer access.

There was a need for more finance to support an extended program of use for computers and for training of staff. He would like to bring in consultants for professional development of staff. Two teachers who were interested in computers organised most of the current time spent on computers. The computer facilities were being built up. Increased numbers of computers were being added to the computer room facility.

He had observed the students were able to use the keyboard and computer functions for writing and was pleased with the progress they were making. The language literacy program in the school was a matter the individual teachers organised but was a geared to the individual students needs. A combination of language experience and some used a skills acquisition mode. There is an awareness amongst the staff of the "K-12" approach and the desirability of students following the general path as far as possible, but without pressure to achieve at a pre-determined age level. The knowledge of individual students progress and abilities is best assessed by the class teacher.

He considered the use of the computer to be particularly useful for students who would be going back into the general school system as it provided a background of knowledge which would be an asset in the general class.

The students in the study group were operating in the moderate level of intellectual disability. Assessment sometimes indicated an IQ within the mild range of disability but functionally they were at the moderate level.
Parents Interview Format

I would like to talk about the effects you think may be occurring as a result of your son/daughter using the computer for literacy at school. What I am trying to do is help their language learning using the computer and I would like you to think about what has been happening during the time that I have been working with the class. Think about what has changed in his/her activities, knowledge of letters, words, sentences, expression. I am interested in how writing/reading activities are approached, what seems to encourage him/her to try to express meaning in writing and if reading is a follow up activity.

*Tell me about the way he/she attempts to write, can you give me an idea of the time that is spent on reading/writing activities at home?

*How do you help your child with reading and writing? Tell me what he/she does and how you assist.

*What do you think about he/she using the computer?

*Does your son/daughter talk about using the computer?

*Tell me about his/her behaviour with regard to literacy since we have been using the computer at school.

*Have you noticed any change in reading/writing activities?

*What kinds of activities in reading/writing/communicating do you think are being encouraged/discouraged by using the computer?

*How would you like the computer to be used at school, for individual student learning activities or by the teacher as demonstrations?

*Do you have any worries about your child using the computer for literacy learning?
Parent Interview MF.

I would like you to tell me about the effects you think that using the computer for literacy at school may have had on reading/writing activities for your son.

What I am trying to do is find out if using the computer can help in language learning/literacy development. I would like you to think about what has been happening during the time that I have been working with the class. Think about any changes in his activities, knowledge of letters, words, sentences, expression. Of course, normal class activities influence this but there may be some aspects that can be identified as being related to computer usage. I am interested in how writing activities are approached, what seems to encourage him to try to express meaning in writing and if reading is an associated activity.

Mrs F has noticed considerable change, especially during the last year. Mark can now read a simple story book and will attempt quite difficult words by trying to sound them out e.g. 'reindeer' in a favourite book. Has knowledge of a number of words which he can identify in reading and write independently, days of the week, names of friends, weather is a favourite topic.

* Tell me about the way he attempts to write, can you give me an idea of the time spent on reading/writing activities at home.

He spends a lot of time drawing pictures and will write a 'story' with the picture, will write:

 e.g. 'It is a rainy day'

Draws a cat and writes - This is a cat', (simple sentence structures).

There is always an exercise book and computer paper available, he writes whenever he feels like it. Some days, when he has an interest he may spend over an hour, sometimes less but at the very least five minutes a day -but most days more, twenty minutes or so. Sometimes he will staple his efforts together in a book form.

* How do you help with reading and writing? Tell me what he does and how you assist him.
Often in the early morning at breakfast time he will write and draw. He has a Macdonalds Calendar and will write birthdays and names of his school friends.

If he asks for help with words he is shown but gets him to spell out the word if he is reading. Mrs F also reads to him at times but has difficulty as the toddler of the house likes to join in and turn the pages. Mark also reads to the baby but she keeps turning the pages before he is ready.

Sometimes he will set up a pretend class (imitating his older sister) and will write out a class list. He uses paper, scissors, glue and staples in writing and creative activities.

* What do you think about Mark using the computer?

Mrs F is sure the computer has helped Mark, he now makes up his own sentences and she feels that it has helped with the process writing although she feels that it is not all due to using the computer, the teacher has been very good in all activities in the class and the integration with other classes have all contributed. This is certainly true, but she still feels the computer has been helpful and is good for holding his interest and that my 'tutoring' had been good for him.

* Does Mark talk about using the computer?

Not specifically about what he has been doing on the computer himself, but he mentions that I have been and who has been using the computer.

* Tell me about his behaviour with regard to reading and writing since we have been using the computer at school - have you noticed any changes in his activities.

He has shown a great deal more interest in the last year, has learned to sound out his words when he is unsure. He will do a great deal of writing for his grandmother, he gets more attention when he is there by himself. He has pencils and writing pad and will keep drawing all night (evening). Reading (in particular) has improved. He uses Cards with Words and will also 'play school' with his grandmother.
What kinds of activities are being encouraged by using the computer? do you think there are any discouraging aspects?

No, feels that writing and reading are encouraged and is worried that he may lose some interest next year when he goes to the local school. Would like to have him continue to have access to computers. The school Mark is going to has computers but the teacher has not as yet organised for use of the computers. This will be put in operation when the teacher is ready. They would like to have a computer at home. Mark is very interested and Mrs F is keen for him to retain that interest.

How would you like the computer to be used at school, for individual student learning activities or as demonstrations by the teacher to the class?

Thinks that individual use is best for the children in the special school classes but it may be alright in regular classes for the teacher to control the use for group activities.

Do you have any worries about mark using the computer for literacy learning?

No, there are no problems, it has always been seen as a benefit especially since the school held a session at the Professional Services Centre when parents were invited to see what could be done using computers.
APPENDIX 3

STUDENT RECORDS
APPENDIX 3

For ethical reasons surnames have been blanked out. Where names do appear in the text, they are false.
Mark

Mark, at five years old, the youngest of the students generally worked steadily by himself, not communicating very much at all but after a while, in one of the language experience sessions he showed me his story(drawing) saying it was "Cissie" (his sister). He could write his name and some letters, quite a few numbers and like most of the other children in the class demonstrated the beginnings of literacy learning. He had written his name for me, using my pen, attempting both first and second names, he achieved only the first part of his surname but used capitals to begin and left a space between the two names.
' Makk Fokk'
13.8.85.

His first time on the computer he 'pecked' at the keys carefully, exploring what happened, watching the screen to see the results. He then typed "Kylee - Mark- Patrina (with help from Patrina on her name), numbers to 10 and then reverted to random letter typing. He pressed the keys carefully, selecting one at a time and explored the function keys and discovered the use of the delete key. He pressed the ESC key but could not work out why he could no longer type but after pressing it again and getting back to the type mode he deleted everything.

For the first few sessions he would quickly delete everything before I had a chance to save his work.

The second trial Mark typed his name correctly, then numbers and interspersed random letters. He then went over the keyboard methodically, watching the screen, repeating letters this time by holding down the keys. He remembered the delete and held down to clear everything except his name. Then spontaneously typed letters in alphabetical order saying them out to himself as he worked. He looked carefully at the keyboard and asked "where's 'v', then where's 'w' and where's 'y'. " Apart from these letters which I pointed out for him he completed the alphabet unaided. He then deleted everything and proceeded to fill the screen with R's and again deleted everything. Talking with the teacher later, he said he was not aware that Mark knew the alphabet and that he attended speech therapy as he had a communication problem. Whilst he was at the computer and interested in what he was doing he had no difficulty in communicating, he said "I can do that" quite clearly, when he saw me changing the disk and I showed him how,
afterwards he would place the disk in the drive carefully when starting up.

Mark changed from continuous exploration of all keys and functions to carefully noting what happened when he tried different actions, he also abandoned the habit of deleting everything.

23.9.85
After typing his name independently Mark dictated Happy Birthday Mark, which I typed for him (communication no problem).

24.9.85
Mark typed his story, with help from the printed version I wrote at his dictation, where he was unsure I would indicate the letters (such as h and g) but most was his own effort. He remembered spacing and when omitted went back and corrected by deleting and typing again. He changed to lower case, correcting from G to g in 'go' after asking how to "get little". He copied 'I go to beach and plah in the samd'. He used h for y in play and m for n in sand but this may have been overlap as the letters are adjacent on the keyboard. He then copied 'i SAW the red ladybug in the garden'. He changed to upper case for SAW after pointing out the i but did not correct this and he changed back to lower case to complete the sentence. He told me he was going to have a party and typed with assistance from print and pointed out letters, for 'going', he started 'go' and I printed 'ing ' to show him the ending. I said out the letter names for 'have' and 'party', the rest he typed independently and used spaces for all sentences. He also tried a program called Reader Rabbit which has a word/letter sorting base and coped well with the section which requires selection or rejection of a sequence of words according to whether they have the same letter in the same position as the one in a displayed word. He could not, however select words with one letter different in another section.

30.9.85.
Mark typed his name to retrieve his file and typed numbers to 24 independently, he then deleted everything and reverted to 'playing around' and 'baby talking' - I would not allow this to continue so he missed doing anything constructive that day. (Talking with the teacher the following day we both noted that the whole class had been unsettled and were difficult and restless for some reason the previous day.)

1. 10.85.
He said he wished to try again and would not play around. This time he typed the date copying from my written figures then decided to type days of the week, he attempted these himself, by sounding out the beginning letters, getting the first few letters (from memory) tu (tuesday) thu (thursday) sat (saturday) and completed day for each after checking on chart. I assisted where he was unsure by writing the letters down. He then typed his sisters name 'donna' (with help) and dictated a story to me, which he then copied onto the computer. He typed 'mark' independently then copied from printing 'is going to play lunch'. He worked well, concentrating and sustaining interest. (About twenty minutes.)

8.10.85.
Mark typed his name independently to retrieve his file then again before copying the date, 8.10.85, he inserted stops as I had after asking "Where's that?". He then said he would write his address which he told me. I wrote it down as 16 BOOK St, his attempt '16 BOOIK' (actually, 16 B---- St). He then dictated a story which I wrote down and he typed as 'IG TO THEBEACH ANDPLAY IN THE SAND', he omitted some spaces linking two words together, he did not correct this. Mark started independently with IG T (the starting letters of the first words, as he sounded them out), the rest he copied from my print.

15.10.85.
Mark remembers the space and delete keys and will go back by deleting and correct if a space has been missed or if he perceives an error. He is trying to spell words himself but will ask if the letter he thinks of is the 'right one', is happy doing days of the week (Tuesday Thursday and Saturday seem to be the ones he has under control) and is now typing the date copying from my page. He added 'tuesday' independently after the date. He copied SATURDAY from my typing as 'SATURDY', missing out the A. He is also copying from written work and books, Twinkle Twinkle Little Star and Baa Baa Black Sheep, were copied from a book, saying out the rhyme, with correct spacing and using return to go to the next line as in the book after asking how to go to the next line. When he got to 'three bags full' he said that's '3' pointing to the number and redid the line underneath using the number 3, '3 BAGS FULL' and followed with numbers 1 to 12, he knows numbers up to forty or fifty.

21.10.85
Mark is working independently, he typed a number of letters and numbers then 'my name is mark fornell' (needed help to spell name.) asked "is that next?" sounding out the letter he thinks comes next. He is getting his full name under control, only one letter missing from the surname and one wrong letter, but he missed the capitals when typing which he uses when writing.

22.10.85
Mark copied stories which he dictated and I wrote down but I am now encouraging him to try to 'write' the words himself on the computer.
The following were copied from his dictated story which was printed out:
DONNA GOES TO SCHOOL IN A CAR - 'donna goes to school' (spaces and typing correct but he did not complete the sentence, he typed donna independently , started 'go' for goes and typed 'to' independently).
SHE HAS GONE TO CAMP TODAY- 'sheag' (the middle letter of has and first letter of gone, his own attempt at has gone) , he then went to the next line and typed 'gone to campcay' , gone to was typed with help with the e but to was typed independently, camp was copied and he finished with the first letter of camp and the ending of today, this was copied but he missed his place and typed the first letter of one word and the last letters of the next word.
MARK IS ON THE TRAIN-'mark is trani' , he typed 'mark is' independently with prompting for 'is' he reversed the two end letters of train as he copied it.
He used lower case throughout, omitted some words and made a number of errors such as missing letters, he may have lost concentration.
Mark can type THE, IN, A, IS, ON with just a little prompting like "what do you think it might be? or "how do you write ...?"

29.10.85
Mark copied from his story book (Language experience drawing and writing)
"This is us swimming" , he used the capital letter to start as in the teachers' writing in his book and copied correctly.
He then independently typed his name after the story correctly but used lower case, he used return to go to the next line and typed his address correctly, again using lower case, he finished with a full stop at the end.
In February, 1986 the visits to the class on the primary integration days continued.

1986

18.2.86
Mark typed MARK FO------ in upper case and corrected the use of I instead of L, he took the cursor back using the arrow key instead of delete. He had experimented to see what happened when he used the arrow keys. He then typed CAT independently and used the return key to go to the next line. He typed I GO FOR A .. asking if each letter was right as he went along and started to type swim independently, decided to change it to swimming but needed help with the ending. He then typed 1986 then deleted and retyped swimming, remembering the double m when retyping (he did this unaided). Mark can type readily from spoken letters (when being assisted with spelling) and from written ones, selecting the correct letters on the upper case keyboard to match lower case written letters. (This record was later deleted).

25.2.86.
Mark copies easily from stories in his language book, he knows upper and lower case letters and experiments changing with the shift key and uses cursor moves to get to the desired position. He deletes and inserts spaces when omitted. He copied:
I WOULD BE THE HIGH DIVER as 'I WOULD BE THE IGH DIVES .' he missed the H from the beginning of HIGH and used S instead of R for DIVER and finished with a full stop.
I WOULD CLIMB A TALL LADDER was copied correctly but was not given a full stop.
For his own dictated story "Snake swimming in the sea" assisted by my printed version, each word printed as requested, the last three words were typed unhesitatingly and independently, he copied the first part from my print but completed these without referring back to my print. He used return to go to the next line after SNAKE and after SWIMMING but typed IN THE SEA on one line.

3.3.86.
Mark typed his story with assistance , he would type and ask if the letter was right, I would assist when he asked but let him carry on if he would. He typed 'I HAVE , then used return to go to the next line then typed 'MY BARG and again used return and typed 'AT SCHOOL' 'barg' was his own attempt at bag, he asked for help with 'have ' and 'school' but the rest was his own independent work.
10.3.86.
Mark copied from his book and was assisted by my spoken letters, he used lower case. 'the cow jumped over the moon', he hit y instead of u but the rest was error free. He then copied from my print of his dictated story, again with words printed as he required assistance. 'rudolph the red nosed reindeer'. He copied 'rudolph' but typed 'the red', with some prompting, he omitted the spaces between red nosed and reindeer when copying and did not correct. He then typed his name in lower case using i for l, and put a stop after it then went to the next line and copied the date from the board, again omitting spaces. He typed 'monday 10 manrch 1986', he put in 'n' then corrected with r but did not delete the error (he mistook the small r on the board for n but then realised it was r). He then typed on the next line 'windy day' with help only for the y at the end of windy, he followed this with 'rany DAY ' CLOUDY DAY (again using I for L) independently then checked a chart for "SUNNY " but could type DAY without reference. He changed to upper case after 'rany' because he decided he wanted "Big letters". The letter A was then investigated, the different forms of a A and the written lower case a while I pointed out that they are all different ways of writing the same letter. He was trying to work out the difference in the written small a and said "it's different" when he typed the small a (I think this means he is now understanding that they are the same and while he has for some time been able to associate the two- upper and lower case he has just realised that they are essentially the same and now also notices that the small typed a is another different form of the same letter - the beginning of transfer or generalisation?) (The latter part of this was later deleted but a printout had been obtained).

18.3.86.
Mark copied from his book correctly 'thats my house.' he used lower case and put a full stop at the end as in the book. He then typed 'donnais a soool ' (Donna is at school) independently, he used return to go to next line quite deliberately and continued to use space and arrow keys to move cursor around, (he corrected missed spaces most of the time but not always). He typed his name with a stop between the names and then his address independently. He missed the r out of the street name but otherwise this was correct.

24.3. 86.
Mark continued to copy from his book, sometimes he confused b and d and i and l but was quite confident, he recognised some words 'the ,1 etc (beginning reading!) He also used stops sometimes. He copied 'I WOULD BETHE HIGH BIVER.' (I WOULD BE THE HIGH DIVER), using I for L and B for D, he omitted one space and used the full stop. He then copied 'I WOULD Jumpdown INTO THE WATER.', this time he used L in would and d for down, he omitted some spaces and the full stop, he also changed between upper and lower case as he typed.

7.4.86.
Mark was starting to write words without assistance and using 'temporary spelling'. He typed 'sunny CIODY RENY ' (sunny cloudy rainy) independently then 'MICHEL K---- ' (MICHAEL C----) almost correct, he missed only the A from Michael and used K instead of C for the beginning letter of Michael's surname. He then typed his own name and address but used Y instead of R in the street name and misspelled the suburb Dapto as DOPO. He occasionally asked for help with spelling but was attempting words himself- moving along the path to writing.

15.4.86.
Mark typed his name correctly but omitted the space between. Mark was choosing to use capitals when he wished and changed the shift key he also used return to start a new line. He was still copying stories from his book and having trouble with b and d but was trying to work it out, sounding the letter out to help. He copied from his language book 'I WOUID CIMB A TALL LADDE TO THE TOPOF THE TENT', he used return to keep to the same lines as the book. He used I for L and missed L from climb then omitted R from ladder, but the second line was copied correctly with the exception of a missed space. After the copied story he added SUNNE RIANi (sunny rainy) independently, working towards the correct spelling).

28.4.86.
Marked typed names of friends independently with stops and spaces between, 'KIM. KYLEE. MICHAEL. RICKY. 1986. MICHELLEW. He asked if C was correct in RICKY as he put it in, he added the beginning letter of Michelle's surname to represent it. He put into upper case for names then changed to lower, deleted this and reverted to upper case. He went to the next line and typed 'school.' correctly with a stop after it then typed both his own names on the
next line without a space between. He typed rows of C's, deleted and copied from headings on screen TYPPE IN TEXT (had an extra P in type).

29.4.86.
Mark typed his own name with a stop between the two names then typed friends names on separate lines using stop and return, then his address, using a separate line for each item and missing the r in the street name. He then typed HOT CROS BUN independently sounding out to get the letters and asking if it was 'right', I said "That's excellent work Mark."

20.5.86.
Mark typed MAY independently 201986 for the date with a stop after it. He then typed his first complete sentence in his own temporary spelling I HAV GT NYW SIU (I have got new shoes). He then typed a string of names, his address and phone number TUESDAYFIRDAY, his own name followed by SUNNY DAYHOT, numbers then WINDAY (his own spelling) which he corrected to WINdy.

24.6.86.
Mark always retrieved his own file by this stage and put the disk in if I had not already done so. He copied from a poster on the wall after discussing the fireworks he had seen. He said 'they were orange and blue and red' Independently typed 'I SAW' then looked at the poster for help with colours and asked for help with FIRE but added WRKS himself. He was putting in stops, changing to upper case when he wished to and using the space bar.

8.7.86.
Copied date from mine adding JULY TUESDAY from the board then typed his name and decided to write about pets. Asked for assistance with PETS but attempted Rooster (RIASDY) and typed sun, then RUNING IN THE SUN AND RIN (running in the sun and rain).

7.8.86.
Copied Thursday 7th August from the board, missed s out of Thursday. used stops at the end of the date and between his first
and second name and his address and phone number which he was writing correctly at that stage. He followed this by a complete sentence "IN THE RAIN I GOT WET" this was a comment on the rainy day, this time spelled rain correctly after checking chart.

11.9.86.
Typed Thursday, 11th independently then checked September on the board he used comma after the day and a stop after the month and used return to go to the next line. He added numbers to 10, then couldn't think what to write about. They were studying the letter R in class - I said what begins with R? He typed Robot then Rabbit from the board, I asked "what do you know about a rabbit? he said "has fur" so typed that with help for the U in fur. He then copied from the display at the top of the screen but returned to THE RABBIT - I asked what else do you know about a rabbit? he responded 'is furry and - I prompted "And?" he said, "has long ears". He then typed this in asking for help with 'furry' and 'long', sounding out the letters to try if they sounded right. He attempted 'Ears ' independently getting 'IES" as he sounded out letters.

THURSDAY, 11TH SEPTEMBER.
123456789 10
ROBOT RABBIT HAS FUR
TYPE IN TEXT AT CURSOR ESC FOR MENU (COPIED FROM SCREEN MENU)
THE RABBIT IS FURRY and HAS LONG IES (EARS)

10.10.86.
Mark typed S and F repeatedly then deleted and typed the alphabet unaided he then typed 'Mark is seven years old on 22nd September 1986. (he put a stop at the end and checked spelling on chart). They had been on an excursion and I asked what they had seen, He said "Boat at Figtree "He then typed Boat correctly, attempted Figtree, asked for help but got 'Figtee' sounding out. He then said "We went bowling at ten pin" typed 'WE WENT TO 'BEAN' then asked for help and corrected to BOWLING and then added AT TEN PIN, sounding out for PIN but able to spell 'at ten' without doing so (from memory).

14.11. 86.
Mark got a clock and typed the time moving the hands around each time and saying "12 o'clock, 1 o'clock etc right around the clock. He then copied the days of the week from a chart, selecting two letters
at a time and typing together. He changed from lower to upper case and back again whilst doing this. He then typed independently 'apl FUR DONNA' (Apple for Donna).

1987

12.3.87
Showed me his book, then remembered to do the date "I'll do the date first" he said and typed THE. 12TH independently used space bar and copied MARCH from the board and placed a stop after it. He then copied from the story book THIS IS DAVID. (put in stop, typed AND independently then continued, SUE. AND. WENDY. he added numbers 1 to 10 then went back to copying from the book. DAVID is INTHEBUS DAVIDISIN THE. He corrected independently and inserted some spaces when missed but left some out. He used the shift key to change to lower case then deleted and went back to upper case and used arrow keys to move the cursor.

19.3.87.
Mark independently retrieved his file following retrieve procedure, needed help to determine which to go to first. He changed to upper case said "capitals" He type the date independently 19. MARCH. 1987. then added THURSDAY WE HAVF. PE (have PE). He then copied from the top of the screen TYPE IN TEXT AT CURSOR ESC. FOR. MENU. MOVE. without errors, watched the screen close-up trying to see into it to see what was happening. He the typed STEVEN to retrieve the next students file without assistance.

2.4.87.
Mark retrieved his file independently then moved down to the bottom of the file using the down arrow (cursor) key, reading some of his writing back as he went down , picking out words he could recognise.
He typed 2 then used the shift key to type APRIL and checked the chart to make sure of spelling, typed 1897 at first then corrected to 1987 as he saw his error and added THURSD looked around for a calendar said "I'll get calendar" but comes back with a showcard with THURSDAY on it. He then played around with moving the cursor then started to copy from a book 'ONCE UPON A TIME. THERE. WAS (he inserts stops where he feels it is appropriate). He tired of copying and decided to write Name and the names of the class, he spells all of these correctly then I asked "what are you going to
write about all of the class? he then added 'HEVE BEUN CELLD TODAY (have been good today)

30.4.87.

Retrieved his file independently and went to the bottom of the file, read out some lines of previous work as he did so.
He looked around for the date, I told him 30th of April, he finds APRIL on the list of birthdays (recognised what he wanted) type fOO (of) APRIL then copied Thursday from the board. He had changed to upper case then back and started typing names of some classmates, he typed Ricky in lower case then deleted and redid in upper case. He is again using spaces well and goes back to insert if missed after a few names were completed I asked what are you going to write about them today? He typed A GEOFOT ON THE BAS (ARE GOOD ON THE BUS, sounding out letters as he went along) THEY GO HAME AFTA SCHOOL AND .. he wanted to write PLAY but was unwilling to try it, he sounded it out but was not willing to attempt it and went to find a book to help him spell it. He went through several books but could not find it but kept looking, he knew it was not there. I checked, and none of the books he looked at had the word play in them. Finally I pointed to a wall chart on PLAYSCHOOL, saying "have you seen that chart?" without indicating that it might help but he knew immediately that this was what he was looking for and completed his sentence with PLAY.

7.5.87.

Mark retrieved his file and went to the bottom reading out some of his previous work as he did so.
He started May with a small letter, deleted and changed to upper case, he is now putting in the date himself each time with little reference to the board. Decided to write words starting with B, copied BAT from lower case hand written work then BOTTLE, attempted BRONSON himself, got an extra O in it BLUE was done independently, BY and BIRTHDAY from poster BUS was written independently BANK from the computer disk. He was saying out as many words as he could think of starting with B and picking them out from environmental print, BEAR from poster added "BigB Littleb" twice then typed BEGN WTBE B (sounded out -begin with B).

14.5.87.

Mark retrieved his file and proceeded to end of work pointing out some words and sentences on the screen. He typed the date
independently, used an apostrophe instead of stop then corrected. He then copied phrases from a book he selected, DAVID HAS BOAT WENDY HAS DOLL (used zero (0) instead of O in doll then corrected, he realises there is a difference, he typed too many L's then corrected) SUE HASHORSE (omitted to correct space here). He used return to go to the next line after each phrase. He then copied 1ST 2ND 3RD from a chart then attempted the word, I helped with FIRST, he typed SAD (SECOND) 3RDFD(THIRD) then copied printing from disk coverFLEHIBLE AISK (FLEXIBLE DISK -the print was more complex than that he is used to) and MOVE 830 (he read this out as" MOVIE eight thirty") from the computer screen. He then typed the names of the whole class and CAME (COME) TO SCHOOL WEHF (WITH) ME independently.

21.5.87. Retrieved his file as usual then started playing around with keys not ready to start, needed prompting to start a story, I asked him what he had been doing. He told me "I went to Mrs Br----'s to sleep" He picked up a pen and started writing 'I Went - asked next? when he came to the E, I told him then helped him to spell MRS BR----- , he typed "WE WEAT TO MRS BR---- AT4 DAY TO SLEEP WE WR HAPPY. (We went to Mrs Br---- at 4 days to sleep we were happy)He needed some encouragement to continue but then he typed MRS D------ (with help) WSAT HEME WE WET TO SEEAT MRS D------ (was at home we went to see Mrs D------). He told me "Mrs D------ (The teacher) lives next door to Mrs Br---- ".

28.5.87. Retrieved his file as usual, pressing return twice to get the file and moved to the bottom of the file. He then typed the date and without any further preliminary started to type in his own way 'at HEME I HT BRGAEFST WAC BCUS '(At home I had breakfast weetbix).
He then copied words from the board YELLOW YABBIE YACHT then pointed out to me all the things around the room that were yellow in colour, in posters, equipment, desk top materials, clothing etc. Pointed to yellow leaves on a poster and typed 'YELLOW LAS '(LEAVES) then MARK and TONY on separate lines using return then B CLOOT (BE GOOD)
his next sentence was much longer than usual 'WE HET A DEUS DAY (we had a dance day) AT SCHOOL (at school typed correctly, completely independent) ET WAS A VRWEGOOD (typed FAW at first for very then changed it to VRWE, GOOD was typed correctly) TAM (time) WE ALLAT FEN (we all had fun) AND (correct, he then copied 'dance day' from my type on screen then deleted this and replaced it with AT SCHOOL which was correct and independently typed. On a new line he then typed MSS (Mrs and asked for help with D-----) WSHAPPY (was happy, copied happy from chart).

4.6.87.
Typed date after retrieving file then continued independently typing
'MEALIE AND MARK WS CAERN" (Melanie and Mark was crying - at this stage he is typing and telling me what he is writing) DONNA VEL BAER (Donna is feeling better) goes to next line to type THURSDAY which was copied from the board he then pressed return to go to the next line and copied from his process writing book 'THIS IS ASUNNYDAY" (types day independently then goes on to type "TODAY HAT(hot) DAY" without reference to the book, this is his own comment on the day. He then read from a poster card "can you see the autumn leaves?" (the poster read colours but he interpreted it as leaves, they had been doing a unit on Autumn) he then copied from the card, had nm in Autumn which he corrected to mn, he then looked for the Question Mark and found it but had it in lower case so the dash was printed. I then showed him that he must press shift to get the symbols on the upper half of the keys and he typed through all the symbols to check. He then copied' NEST' but "NITHE TREE APPLMUMMYS (in Mumys apple tree) was independent. He again type NITHE but erased and typed NAET TIME NI (corrected to IN) THE SAEKY (Night time in the sky).
2.7.87.  
Mark retrieved his file and typed '2. JULY 1987 (looked at the board to check the spelling of July). He copied FEATHER from his workbook then his surname and asked "what else starts with F?" "Fish", I said and encouraged him to try to spell it, he got FEHIS (not a bad try). He then typed 'MRS BAEREN HERT a SEAEM LEAAM IS CEARAN FRER ME CAERHN' (Mrs Behrens had some lounge room and kitchen for me - is clean). Tried shift to get symbols. Mark then copied 'DATALIFE' from the disk cover and then typed 'ON MONDAY IS HAETDAY WAHFT MRS DA----- ' (on Monday is holiday with Mrs D------) independently.

23.7.87.  
Mark retrieved his file by typing his name and moved to the end of the file. He read out some of the text as he went, he had some difficulty with a few words but he was reading back his work very well, particularly as some of it is from some time ago. He copied the date from my notes, putting in the dashes as I had done. He then typed MELANIE S BIRTHDAY ON FRIDAY (copied birthday from wall chart, but the rest was independent, he typed FIR and corrected to FRi in Friday, inserted a missed space and ended with a stop. I asked "Is Melanie going to have a party?" He did not reply verbally but typed 'YES SHE HEAF A PEATE' (yes she have a party) the written dialogue continued when I asked "Have you got a present for her?" he typed 'A PEASSAEAN.' (a present). He again ran through the symbols holding down the shift key. He then typed 'ADAM DAED CAEEAAS THE FHRSH' (Adam did catch the fish). He then typed YAD (DAY ) AND MARK DAY ADAM. He continued to respond in print to my comments, I said "the sun is coming out" he typed 'YES' I asked "What do you do in the sun? he typed I SEAEEP IN THE SENNY DAY (checked on the board and corrected to SUNNY) - I sleep in the sunny day. I asked "do you go for a swim? he typed 'NO'. I then asked him "are you going on an excursion soon?" he typed 'AT FEAEE ' (Figtree). My next question was "what will you do there? He looked around and typed 'H AET SEMME FEAT (have/eat some food) I asked 'what kind of food?' he typed AEPPLAND OEATURG BAERTUES ( apple and orange bananas).

30.7.87.  
Mark retrieved his file and read from the text as he moved down to the end. He changed to upper case and typed the date. He then went to get word cards and copied from them different words 'OPEN AND
CLOSED IN AND OUT.. etc then a name and address of another student. He goes back to a previous weeks work and inserts his name. The teacher starts to read to the group, Mark is not inclined to concentrate further and he finishes to go and listen to the story.
13.8.87.
Mark retrieves file and types date independently. He then types 'I WAT TO MRS BROWN 4 NEATS I GO HEME ON FRIDAY I HET SEME BREFKASTS' (I went to Mrs Brown for four nights I go home on Friday I had some breakfasts) He told me he likes to go to Mrs Brown, he had his breakfast there. He then copied from a book 'A BOY PUT ON HIS SOCKS SCARF AND GUM BOOTS TO GO OUTSIDE TO THE SNOW'. He then typed independently 'MARK FO------ IT IS COLD LT IS WINTER LT IS RAINING (has mistaken L for I).

20.8.87.
After retrieving the file and typing the date he copied from a book 'I CAN COUNT 1 FROG 2 SOLDIERS 3TEDDY BEARS 4 MUGS then the name and address of another student from the show cards. Seems to be abandoning independent attempts just now and looking for safe things to copy.

3.9.87.
Mark retrieved his text and read from it as he moved to the end of the file. He typed the date and changed to upper case then copied from his own written sentence ' Marks fihs in the warter ' MARK FISH IN THE WATER' (he knows there are mistakes and corrects fihs to fish and warter to water, I show him how to correct fish without deleting other words by moving cursor with keys and only deleting the incorrect part). He then played around inserting and deleting random letters but then typed independently 'DADDY IS GOING TO WEAK (work) TODAY' and 'TODAY IS THURSDAY 3ND SAPTEMBER' (corrected to September, I again showed him how to move over letters to change A to E.)

10.9.87.
Put a stop after MARK when trying to retrieve so he had to start again. He asked "What's the date- then said "oh yes 10" - (he always knows the date) and typed in the date. He then typed ' FISH SMMING IN THE WATAR(fish swimming in the water) independently then 'MICHAEL MELISSA MICHELLE (seems to be trying to stay on names or familiar words he feels able to spell correctly, I asked "well what are you going to write about them?" he responded with 'GOOOD AT SCHOOL TODAY'. He then copied from the disk box DATALIFE and then from the tape recorder on the desk 'RECORD REW PLAY F FWAD STOP EJECT' I asked him "what
does that say? pointing to the words, he replied to Play and Stop correctly.

29.10.87.
Mark retrieved his file by typing his name, sounding out the letters as he did so (he remembered the problem from the previous time). He read from the text as he moved through, he saw a mistake and started to correct it but did not completely rectify the error and went on to the end. He typed the date and put brackets around 10 and 87. I asked "why did you do that? he replied "because I wanted to". I then asked him "How do you think of what you are going to write?" but he did not respond except to say "capitals and letters" and typed Vv Mm Ll Uu Yy Qq Bb Ff Ss saying out the letters. I asked "Did you go anywhere in the holidays?" he typed 'NO' using on screen dialogue instead of speech. He looked around the room, looking for ideas then copied DATALIFE from the disk box then 'Shellharbour Square' he then typed 'EMMA AND MELISSA TALKEN BAT BOOKS' (Talking about books - he said the words out as he typed) 'ON MONDAY ON WEDNESDAY. I WAS COMEOM TO SCHOOL TODAY' (I was comeom to ..).

19.11.87.
Mark retrieved his file and typed the date then copied from the board saying out the letters 'NEWS MONDAY MICHELLE AND MEGAN AND JAMES TUESDAY BRONSON MELISSA EMMA, he pressed return to go to the next line and typed WEDNESDAY RICKY TONY THURSDAY ADAM STEVEN FRIDAY MARK AND KIM. (he knew the names but checked Megan and James and copied Bronson. He knows Monday and Tuesday, typed Wedns then changed to Wednensens then to Wednedaynse and finally Wedneday, he copied Thursday but typed Friday independently (he usually spells days without trouble). He then started playing around with the keys and I typed 'MARK IS PLAYING' he read this out without hesitation. He then retrieved Tony's file for him.

26.11.87.
Mark retrieved the file and I move it down a line for him to start, he moved it back up then typed in the date. He told me they had been to Shellharbour Square to see Santa Claus, I said 'Well you had better write about that, don't you think so? He typed 'HAGY6IKMMVMCF (Shellharbour Square) SAER KHUFBCS (Santa Claus). He was a little excited and unsettled.
11.12. 87.

After retrieving the file and typing the date Mark got a book and copied instructions carefully correcting errors as he went along. 'FOLD ALONG PERFORATIONS BEFORE DETACHING TO STICK;' (he likes to write words he knows and typed the days of the week). He then typed PANTA (Panda) he had seen a picture on the wall, I said "Panda's live in China" he typed 'IN THE ZOO' I asked "What colour are they?" he typed 'RED' I asked "aren't they black and white?" but he insisted on red. He then told me they had been to MCDONALDS I asked him what he had to eat there and spelled MCDONALDS for him, he then typed 'HANAM BRGR GEPS TO (hamburger chips too) I asked did you have a drink? he typed 'YES. DRREING.
Michelle

Michelle joined the class in September and was very shy and reticent for the first few weeks, however by the end of September after a settling in period she decided to try the computer.

30.9.85
She typed her name as I showed her the keys, then typed again with some assistance, then tried herself it came out as MICLLE. I asked a few questions, she told me she was six and came to school on the bus and did lessons. She decided she would write that, I typed I AM 6, she copied this, I then helped her by telling her some letters and pointing out letters when she could not find them, she typed 'I CAME TO (used Q for O)SCHOOL ON' I then wrote down THE BUS AND DID MY LESSONS which she copied correctly. She then asked me to write P and B which she could not find, she then copied them. Michelle could find most letters without difficulty, she knows letters from sounds and recognises the printed form. She remembered the delete key and used the space bar as shown.

1.10.85.
Michelle copied the date, put in the stops after asking "where is that?" Then wanted to type TUESDAY which she copied from print. She then dictated a 'story' from her language drawing I LIKE TO FLY UP IN THE SKY and copied this, the only error was UN instead of IN and one space was omitted.

8.10.85.
Copied her name correctly and independently then copied the date. She remembers how to delete and uses the space bar independently when I say "how do you go to the next word", sometimes leaves more than one space between words. She obviously recognises the discreteness of words. Again copied from a dictated story without any problems with letters but left the E off the.
I WENT TO THE BEACH.

15.10.85.
Michelle copied the date but this time left out the stops, she then copied her dictated story from my printing YESTERDAY WAS RAINY DAY. She is remembering the space bar most of the time and has no trouble with letters.
21.10.85.
Michelle told me about her puppy Tiny Tim. This time she tried typing as I helped her to sound the letters 'I HAVE A LITTLE PWPPY HS NAME IS TINY' She used W FOR U and left the I out of HIS.

22.10.85.
Michelle a little withdrawn today but typed her name and I managed to get her to tell me that her daddy came to school. I printed this for her and she copied but she was not very interested.

1986

18.2. 86.
Michelle typed her first name independently MIHELLE but needed help with sounding letters of for her surname, she got WI independently then I helped to complete WI—-. Copied RED from a chart but wanted small letters as on the chart so I showed her shift and she repeated in lower case then copied' big little', this reminded her of her dog so she decided to type DOG TINY which were copied from my printing. She is mixing up J and L but realises when she sees it on the screen deletes and corrects.

25.2.86.
Still using space bar independently and delete when needed to correct. She told me she "Saw a baby lion at the circus" so I printed that and she copied from it. 'BABY LION AT ETHCIRCUS' She had 'the' with E at the beginning but generally copies well, has not shown any inclination to explore keys, prefers to copy.

3.3.86.
Typed 'I WENT TO THE PIZZA HUT ' as I spoke the letters only needed help with a few letters . I tried the program Reader Rabbit , Michelle could recognise and read CAT COT MAT CAB and coped with the program with few errors.

11.3.86.
Michelle is now typing her name independently to retrieve her file but sometimes deletes if she types it again. She copied from her writing book but forgot the spacing. She experimented with the shift key. I showed her the upper and lower case forms of a number of letters and she changed from lower to upper case part of the way through her story. 'iwouldbeTHEHAPPYCLOWNAT THECIRCUS'.
18.3.86.
Michelle was a little bit tense today but attempted 'I L' then changed to lower case and continued 'ik' then asked me to print the rest for her E TO PLAY WITH PATRINA. she copied this in lower case and omitted the space between TO and PLAY.

14.4.86.
Michelle typed her name to retrieve her file then typed PATRINA independently. She then copied from a story in her work book which was in lower case but typed in upper case without any errors and used space bar without any omissions. 'THE BALLON FLOATS IN THE AIR'.

15.4.86.
Retrieves her file independently and copied from my printed version of her dictated story 'I HAD A BIRTHDAY PARTY AT SCHOOL'. She typed PARTY and AT sounding out and omitted spaces, then wanted to write computer after telling me she was to have a computer at home. I printed it out and she copied this.

21.4.86.
Retrieved her file by typing her name then copied from lower case text in her work book, (her language experience drawing with text) using lower case. She omitted all but one space and missed the D from 'and' & 'friens' and needed help with N and T. 'thatsmarkansomefriens thisispatrina'.She then looked around at charts in the room and copied 'red yellow blue' then repeated, this time typed red independently referred to screen for help with yellow and blue. She put all spaces in between words.

20.5.86.
Typed her name independently, told me it was "Tuesday 5th of May" reading from my 20-5-86. She spontaneously (without any suggestion from me) picked up a book with the intention of doing some 'writing from it. She then copied RAInbows and spelled out colours from the book saying out the letters she typed GREEN independently then copied blue yellow and red from the screen (previous work) but used b for d in red. She asked for help with brown (saying out the letters) green was again copied from the screen and could read blue yellow and red on the screen which she again repeated, still using b for d in red.

3.6.86.
Michelle told me the date "Tuesday 3rd June". Then asked me to write 'TUESDAY IS THE DAY WE HAVE THE COMPUTER' she then copied this using lower case and inserting all spaces.

24.6.86.
Typed her name to retrieve file and indicated there were two l's in Michelle. She then copied from a poster on the wall and put two l's in colour but then corrected it. She switched from upper to lower case and put in all spaces except one. 'THE COLOURS are in the sky red and yellow and purple.' She put a stop at the end of the sentence.

8.7.86.
Michelle typed TUSDAY. and put a stop. She looked around the room for ideas to write then typed her name MICHELLE WI------ (G for N- I think she just wasn't concentrating). She then typed TINY independently then words from charts around the room, sometimes just illustrations but she would say "Bear" and then type, asking for help with letters when needed. Produced CLOWN CLOC OCTAS (octopus) CIRCUS LEAVES . Michelle then picked up a book and copied 'TWAGTABAGAGAPEASS UGGLE' (I want a banana please Uggle-used g for n again). Then again referred to charts on the walls and typed FUR PANTHER CAC(cat) KANGAROO.

14.7.86
Copied a number of sentences from a book then told me she had 'a big bike', she typed 'Michelle has a - asked for help and copied 'big bike ' from my printing. She then told me she had been to see a show with mummy and I helped her to type that. She started with Michelle sounded out 'went' could type 'to' but needed help with 'show with mummy'. Michelle then picked up a picture book and went through it identifying pictures, I printed the words and she copied them, changed to upper case after 'pram' "GIRL HAS TWO COATS" was an observation of the picture as was 'THREE LADIES' .

29.7.86.
Michelle typed her name to retrieve the file and volunteered an observation about snow, which had been in the news. "SNOW IS COLD AND WHITE" and typed this copying from my printing. I asked her what she had been doing, she needs drawing out, she told me "I SAW A SHOW WITH DANCING AND SINGING". I typed this out and she copied and put a stop at the end of the sentence without any prompting. She then opened up with news about Tiny and she typed "MY DOG TINY DIGS IN THE GARDEN." (with only oral
assistance when asked for, she put the stop in herself. Then went on 
'WE PLAY WITH BALLS IN THE GARDEN TOO. I LAUGH AND SHOUT 
IT IS LOTS OF FUN, I LOVE MY DOG. (This was most expansive for 
Michelle). She then collected up materials to look at and write 
about. We spelled out together TRIANGLE RECTANGLE CLOWN 
CIRCLE, she typed these as we did so, picking out what she wanted 
to write.

18.9.86.
Michelle copied the date then typed her name, she then decided to 
write words that start with...r , thought of Ricky and typed 'ricky 
starts with R'
she then copied' four' and said "four starts with f" so typed that too, 
I helped to spell starts with. She then did the same with one ,two 
and three, giving the starting letter for each, missed out the r in 
starts for three (after showing her the first time for four she had 
continued to type this herself, checking on the screen for spelling). 
spiber (spider was copied from a poster but b was used for d) . She 
then got a letter chart to do frog but the 'strts ith' had deteriorated 
from the initial one (probably feeling tired by this time and losing 
concentration). This was all done in lower case.

30.10.86.
Michelle typed the date and her name , she continues to use delete 
to correct and puts full stops at the end of sentences. This time used 
upper case and typed, sounding letters 'I (WI) WISH THATI AD 
DUCK FEET' (I helped with SH in wish CK in duck &E in feet, then she 
decided AD was wrong , I said "what do you think it should be and 
we sounded it out together and decided H should be in front and 
went back and edited using cursor move which I showed her.

21.11.86.
Typed her name to retrieve the file and started to copy Little Miss 
Muffet (all in lower case) she used i for l which she has not done for 
a long time, but got tired of copying and we talked about camp. She 
had been to camp and had a good time but I had to do the typing 
for her, she didn't want to make the effort. She told me "AT THE 
CAMP SHE HAD LOTS OF FUN SHE WENT WALKING AND FISHING 
AND CLIMBING.

1 9 8 7
The class had moved into a roomier demountable classroom at the 
start of the year.
12.3.87.
Typed in upper case 'MICHELLE HAS A NEW CLASSROOM' did this with just a little help with sounding out letters for new and put in the double S in classroom without prompting.

19.3.87.
Typed Michelle independently but is hesitating and waiting for correction, won't go on unless I say "right" she is unwilling to operate independently. She wants confirmation of every letter. Typed, with encouragement "good news michelle has IOts Offrienbs"

2.4.87.
Typed her name then 'IS GOING TOBRING HER COMPUTER TO SCHOOL TOMORROW' with assistance and encouragement. She then typed MICHELLE again and KIM checking on chart to make sure she has spelled this correctly. She then typed PE IS GOOD - only needed help with good.

7.5.87.
Typed Michelle independently to retrieve her file then '7 may 1987' checking spelling on the board. She then told me she liked red and yellow and blue and green and typed this. Red and blue she could spell yellow and green she checked but had them right.

2.7.87.
Typed "MICHELLE WI---- " independently then 'DID A PICTURE ABOUT HER HOUSE.' (This was from her process writing book, with assistance and sounding letters for picture, about and house, she added a fullstop at the end of the sentence. She then copied 'EMMA IS GOING ON HOLIDAY'. Michelle then said "We all went to MacDonalds", she copied this from my printing. (All in upper case). Seems to be getting over her reticence and starting to talk about different things and deciding what to write with less waiting for prompting from me.)

19.8.87.
Typed her name to retrieve file and told me "Adam is sick today - I'll write that" and proceeded with a little help, she could spell 'Adam is ' needed help with 'sick' but knew 'today'. Then she volunteered " My doll is called.. " copied this from my printing but did not finish. Puts in spaces correctly but this is all in lower case and no fullstops.

3.9.87.
Typed name to retrieve file and added date. Copied from her dictated words 'AFTER LUNCH WEGO TO PE IT IS GOOD FUN' She then talked about her little dog "he is kept upstairs and keeps licking me". She then typed with some help and sounding out letters 'TINY TIM IS MY LITTLE DOG,' she knew -Tim, ,is ,my, and dog from memory ,she put a comma after this - I think it was intended to be a stop.

29.10.87.
Michelle typed her name independently, she usually did this, she then typed 'IS DOING JOT OF WOC AT SCOOL' she needed help with ING on the end of doing, she used a j instead of l in lot but sounded out letters to do the rest with just a little prompting. The class had been talking about bees and she told me "They make honey". She then typed 'BEES MAC HONEY', she asked for assistance with the ending of honey but started it herself with HO and then we sounded out together and she completed, decided on N herself but needed help to decide on EY. She then said" My dog is orange and black" and continued typing 'MY DOGIS' (she sounded out D-O-G, started O for orange then asked for help. She sounded out and went on to ORA then needed help for NG then I added E for her. Michelle can type AND from memory but needed help with black, we sounded it out together and she typed this from the sounds. She said "His name is Tiny Tim" and copied 'TINYTIM' from the screen above. (These 'stories' were volunteered).

5.11.87.
Michelle got a book and copied from this, she goes carefully picking out all correct letters and remembering spaces. She pointed to b for d but knew it was not right and asked for confirmation. She then used I for L which she usually corrected (Some of the other children also do this, the I on the keyboard looks like l, it is a common happening). She stopped in mid stream to go on to do something else. (Check printout)

26.11. 87.
Michelle has a book she pointed to a story for me to read out. She then copied from the book, which was in lower case, using lower case and omitting all spaces and punctuation. She used d for b &g in big but used g correctly in get.
'lookatsamsonsaidpaulhestoodid(big)ttotgetinsidehahahahasaidkate'. Michelle then went through the book showing the pictures and 'telling me the story' (No trace of a stammer, she then told me that
she was going to Shellharbour Square and would have a hamburger and chips and see Santa Claus. (I typed this for her).

11.12.87.

Michelle told me she had been to see the doctor and could not go swimming that day, she has to have a hearing test. I typed this for her then helped her to type 'michelle had a juicy apple the juice ran down her arm.' (She pointed this out to me, so we wrote about it.) This was the end of year and lots of things going on so distractions were obvious).

1988

Now seems to be attempting to put together sentences without prompting, previously, I would have to ask her what she would write about, now she is making more decisions without encouragement.

10.3.88.

Copies THURSDAY from the board, says the letters out and types as she does so, she typed TEN independently, copied MARCH from the board and 1988 independently. This was her decision to do the date in full. She then decided to write about her dog. She typed 'TINY TIM PLAS WITH A BALL' and then MICHELLE IS 9. I started off TINY for her, and helped to decide on TH at the end of with, the rest she typed independently.

17.3.88.

Typed 17 with help to get 17. 3. 88. independently, telling me the date, saying "I'll do the rest" and putting double spacing between the numbers. She then typed her name and told me she had seen the tall ships. There were posters on the wall showing the harbour scenes. She typed 'SEETHE independently and then copied TALL SHIPS from the poster, putting a full stop at the end of the sentence. She then changed to lower case after using a capital for her name. She then typed 'is ni(in,she missed the i at first and then added it) 'the ' independently and looked around the room for 'train' found it on one of the wall charts, recognised and typed it in.

24.3.88.

Michelle pointed to the date on the board but then types without further reference to the board, looked at the screen above for help with March and typed '24 MARCYH 1988' (the error was accidental but she knew it was wrong and pointed it out, I said "do you want
to fix it?" but she said "leave it", I said "We'll fix it another time, shall we?" she nodded. She then typed her name followed by "KIM IS MY FRIEND YESS HHE IS" she got some of the spacing out of kilter, asked for help to spell 'friend' sounding out the letters and asked for help with SH but typed the rest independently.

14.4.88.
Michelle typed her name to retrieve the file and copied the date. She then told me about Easter, and the Bunny and typed independently 'i had an ', copied 'Easter' from a poster and then typed 'egg' independently. This was all in lower case except for the change in copying Easter, there was no punctuation but spacing was correct.

28.4.88.
Michelle typed her name, put in an extra H, said "oops" and went back and fixed it. She tried to type likes got LI then copied it from a card she then typed 'KIM WE PLAY, she typed PLA, knew it needed something else, needed assistance sounding out to get Y. This sentence was her own attempt, without any prompting. 'MICHELLE LI LIKES KIM WE PLAY'.

5.5.88.
This was during the week before Mothers Day and the school had a stall where the children could buy small gifts. They went from the class and did their shopping independently, each had brought money for the occasion.
'I GOTA BID FOR MY MUM ' This was in reply to my question about what she had bought. The only assistance given was 'saying out' GOT and FOR, she typed the rest without help, BID (BIRD) was her temporary spelling.

11.5.88.'MICHELLE IT IS A SUNNY DAY I LIK THE RANY DAY' This was done without prompting, the words 'it is a sunny day' were on the board, but she did not copy from it, the only reference she looked for was sunny on a wall chart. She added 'I like the rany day' herself.

19.5.88.
Michell typed her name then seemed reluctant to get started but she told me she jumps in a puddle in the rain so I typed this for
her. She then said "Megan is my friend" and typed this with just a little help sounding out letters for 'friend'.

26.5.88.
Michelle typed her name, made an error, said "oops" and corrected then copied MEGAN from a wall chart, typed Emma independently then looked on the chart for Tony and typed 'is not here today' as was done from memory, she sounded out N O T - H then looked at the chart for help with "here" sounded out T O and typed DA independently but referred to the board to finish DAY.

2.6.88
Said "My name first" and typed MICHELLE independently MEGAN (copied from screen above and called Megan over to show her on the screen, Megan came and said out her name, recognising it on the screen). Michelle missed a space, said "oops" and corrected, she then typed 'TONY IS HERE TODAY', sounded out H then found 'here' on the screen and copied sounded "D" but typed the rest independently.

16.6.88.
Typed her name independently then said "Emma is my friend now" and typed 'EMMA IS MY FRIEND NSO" independently. (May have intended to type W not S).

23.6.88.
Typed her name independently and said "Today is 23rd June" reading from the date on screen 23.6.88. She pointed to the screen and read out "Megan Emma Tony" then typed them putting spaces between, she then copied FREND from the screen sounding out the letters as she did so.

27.7.88
Michelle got a book and we looked through it. She copied TRAINS from the book then looked at a chart and typed CAT independently without further reference to the chart. She typed S, looked at the board to check for U and added N independently. Michelle then said "Fish is alright" (she was deciding which words to type). She typed F, went to look at the chart, came back and said "ICH" she decided this was wrong and went back to recheck, on returning she informed me "It's SH" and completed FISH. She then said "I'm going to write Emma's name" and typed EMMA independently. (Emma typed in DXGFS - Emma is ten this year - she says 'Tent' - we had been looking through a book with tents in it). Michelle again looked
at the chart and said" There's a fox up there" she type F said "O" for Fox- OX" and typed FOX , she memorised the letters from the chart but did not copy directly. She then said "There's a tree there - T". She then read back all the words from the screen, when she came to Emma's attempt she said "what's that?" then typed TR then asked "what's next?". I sounded out TREES and she said "Two E's" and typed TREES. She looked through the book for ideas and said "There's a frog", read out "The cat sat on the mat" then read "The dog" typed DOG - " The goat" typed GOAT then "the cow" typed COW then said "This is the big one" typed E said "I "then changed to L said out the letters as she typed "two more N T" and completed ELEPHANT copying from the book. She then read back all the words from the screen.

18.8.88
Michelle got the chart, named all the items then typed APPLE, we talked about trees, what kinds , she pointed to her earlier work on the screen and said "That's trees - I'll copy that". She did so then decided to write "orange trees" she typed O asked for help with next letters RA but added NG herself, was satisfied with that and again copied TREES from the screen. She sounded out C A T and typed CAT independently, said "Sun next" sounded out S U N and typed this independently and said "Egg" Typed E then said "The sun's out now" and completed typing EGG independently.

25.8.88
Michelle read back her previous weeks work correctly " Apple trees, orange trees, cat sun egg" then typed her name. She read back earlier work from the screen ""Megan, Emma Tony" then said "Megan's next, typed M and said "E's next"and said out the rest of the letters as she typed MEGAN then EMMA and then said "Tony's next" typed TON and said "Y's next" typed two y's and said "typed the wrong thing - two Y's" pointed to delete and said "You take it out". She had copied from the screen. She got a chart and I said "What have you got there?" she said "This is a chart", I asked" What is on it?" she replied "Lots of things" . I said "I can see a moon", she responds "I can see a sun and a house and a key and an apple up there" (pointing to the illustration). I said "I can see a zebra" she said "It's up there too" pointing to the board where words had been pinned up. She then typed CAT and ssaid "What's next?" found dog on the screen and copied DOG then typed SUN independently and asked me to type the rest but told me the letters as I typed IN THE SKY.
10.11.88.
Michelle typed the date, omitted the second space but deleted and corrected after checking the screen.
She copied BRONSON from the chart then typed IS SIK TODAY, only checking the board to spell TODAY. She said "Emma is my friend", pointed to Emma's name on the screen and said "There's Emma" She typed EMMAIS said "OH OH" and deleted to insert the space between and completed EMMA IS FREND sounding out "F R E N D" then typed PATRINA, needed help with I N then added IS TOO independently.

17.11.88
Michelle read back previous work and looked around the room for ideas. She typed MICHELLE and copied MEGAN from the screen sounding out the letters. She read out names from the screen. She pointed out Tony's name on the wall chart and said "Tony's next" and said out the letters as she typed. She told me about her dog "She is very hot and she likes to drink. She typed FREND saying out the letters. Decided on CAT next then typed DOG copying from the screen and drawing my attention to it. She then copied SUN IS THE SKY saying out the letters as she did this and then remarked "It is now" as the sun had come out again

24.11.88
Michelle typed CLOCK used I for L and Zero for O - only checked the last letter on the board. She then typed EMMA IS MY FREND copying from above.

3.3.89
Michelle and Ricky worked together to produce MICHELLE AND RICKY R ARE IN THE SEJ SAME CLASS THIS YEAR. Michelle typed her name then AND, Ricky typed producing RICKY R Michelle corrected to ARE and pointed out the letters to complete Ricky typed SEJ she corrected to SAME and pointed out the rest of the letters to complete when Ricky hesitated.
**Steven**

Steven came into the class at the beginning of 1987, his letter recognition was not very good and his attention span was limited, he knew numbers to 10. His speech was not very clear and he had difficulty sitting still, appeared very nervy and 'jumpy'. Steven would insist on deleting everything if he could, he liked to start with a clear screen and would press the return key to move things away, so for the first few times some of his efforts were deleted and some confusion was created by his moving the cursor around and deleting the date.

**1987**

5.3.87.
Steven's first use of the computer was exploratory, he used the keys correctly at first then kept his finger pressed down to repeat. He then wanted to "take it out" so I showed him the delete key (he remembered this afterwards). He attempted to type Mark with help from Mark pointing to letters got 'M ARKA AA' then I typed MARK to show him. He typed his own name copying from my printed version and with help pointing out letters. His own first independent attempt came out as 'SAET'. He found the cursor keys and moved this around, explored the different keys then deleted. He discovered the shift key and asked "what does it do", I explained and he experimented, so from the start he knew how to change from upper to lower case, he would often press the wrong one but would persevere pressing the keys until he got the desired letter form. Numbers claimed his attention and he picked them out carefully, saying out the number and deleting if he repeated one by pressing the key too long when he got to ten he put 01 but knew it was wrong but after being shown got it right next time. He then deleted most of this.

12.3.87.
Steven was again exploring keys, deleting and moving the cursor, changing the shift key and was not concentrating on anything in particular. I tried him with the Reader Rabbit program, he quickly learned how to operate the space bar to control it but his letter recognition was not under control. Little was saved from this week but communication is improving.

19.3.87.
I had typed the date which he immediately deleted and wanted to put in Thursday nineteenth, he shifted into lower case, I typed 'thursday' he put in 9 and said "that's the date".

He tried to type his name independently, got as far as SA then tried to type mummy put 'wm' then 'nm' for daddy and 'mhhghhhhhhhhhjhhhhhhhhhhhh for Mathew. He talked about the bunny rabbit which was written on the board and had been in a story read to them. I typed bunny rabbit for him, pointed to the words separately and said them out. He typed a few letters then said "that's all" and finished the session abruptly.

26.3.87.
Steven deleted the date and put it back in as 26.3a.8, he insisted that he would "write it". He then typed se for Steven and deleted and operated the shift key saying "want big letters" again got small letters and typed steven (this was copied from his desk, going back to check each letter) he then Managed to get into upper case and repeated 'STEVEN'. He then typed 'ZXC' SAID "X" as he typed the letter and then said "that says zebra" (these letters are in line on keyboard). He typed 'byuty' as he typed b, he said "that's 8" (capital B on keyboard), he started to type numbers then, naming each one, he jumped from 4 to 8 and said "That's how many I'm going to be" he then deleted and retyped numbers in correct order then again deleted and started again, naming the numbers as he typed. He explored space and arrow keys and asked "what does that do?"

30.4.87.
Steven uses the return key to move previous work to the top of the screen, he likes a 'new sheet' to start. He is now starting to find letters more easily, he knows S to start Steven but still needs help, he typed 'SAT" I showed him E, he copied V from my sheet then got E when I said it out to him, he said "E for Emma" and copied N from my printing.

'SATE VEN' (He still puts in an A). He then decided to type ten '10110 010' he is getting 10 under control, he corrected himself and kept trying until he was satisfied, Again typed his name, checking each letter on his desk 'stevsen' (he is getting closer) then went back to try to type TODAY I CAME TO SCHOOL asking for the letters and needing to have some pointed out. His first attempt aaaaaaaaz (placeholders for today) 'tio2day' as I said out the letters, he inserted the 2 then went through the numbers up to 9, he then tried again 'today' and repeated 'todAY' He then typed 'I AME (missed C but finding these letters himself, saying "A for ADAM, M for Michelle, E for Emma" as I said out the letters. TO he found ("T
for Tony) then copied SCHOOL from my printing and found all letters except H in School independently. He had moved the cursor and ended with spaced out words and some I's inserted.

14.5.87.
Steven used the return key to clear the screen and then said "B for Bronson" and did a line of B's, said "R for Ricky" and typed RI independently then copied Ricky from the desk. He then typed ME for Megan, copying from the desk, deleted the upper case E and goes to lower case Me (he is still using the shift key to do this but is now realising what he is doing and questions why is it in upper case when he wants the small letter). He copied Bronson from the desk using upper case B and changing to lower case. He typed 10 said "thats 10" I said "yes that's right", he was very pleased with this. He typed SAg then deleted, took my pen and wrote on paper g p g, he then asked me my name and I printed it out, he copied 'JANE" without any trouble and said "it's all in big letters" (he is now realising that the shift key actually changes the form of the letters). He again typed SAE and deleted then JANE and again deleted then typed SAE (for Steven). He then took my pen and wrote on paper STE then overwrote the E with e Vg nEo (he was attempting his full name). He then typed KR for Ricky but deleted all of this leaving only the line of B's he started out with.

4.6.87.
He insisted on having June typed in the date instead of 6 "it's June " and retyped the date copying from the board. Steven typed st in lower case then deleted and retyped in upper case then went back to lower case, he hesitated and asked "what's next" I printed a capital E, he took the pen and wrote on my paper 'even' going to his desk to check each letter then copied this to complete 'STeven'. He then copied Mark in the same way but ended with mcrk (he has difficulty with small a, cannot relate this to the keyboard). He typed numbers then decided he would 'write' and selected a card from which he copied 'can yousee the autumn coiours?' This was his first attempt at any complete sentence copying, he did it very well, rejecting and correcting errors, missing only one space and finding the question mark. When he did this at first without the shift key he got /, he looked at me, I said" Well it's the same as for the letters, if you want the top one you press the shift key" - he did this. The only error he did not correct was the i used for l in colours.

2.7.87.
Steven is still clearing the screen to start and between attempts at typing. He typed numbers, deleted said "what's your name?" , I typed MRS COOK, he typed KKK then copied MRS COOK from the screen then copied RICKY from the desk but decided he had finished and said "that's all".

30.7.87.
Steven used return to get a clear screen to start. He gets some cards to copy , and looks for small 'a' still cannot find it. I show him the upper and lower case Aa but of course the printed lower case is not the same. He copies ARM, he is still concerned about 'Big and little letters" and is constantly changing between the two. He uses v for u 'movTH' (mouth), says "how do you get that small h when you press H?" he copies MELISSA from the card and uses I for L 'MEIISSA' then copies OFF and DANGER without trouble, these are in capitals on the cards. He takes the pen and writes letters on my sheet to show me letters he wishes to type to show the difference between upper and lower case. He decides which he wants and changes as he goes along. He then typed his name copying from my written version using u for v and n 'STeueu EU----( this was probably the fault of my writing - it had not been intended for him but he recognised it)8116 _ attempting his telephone number and Rnchn(Rachel). He then typed numbers 1 to 9 and added 10 and 15 correctly. (No longer tries to clear screen between each typing episode).

6.8.87.
Steven asked "How do you write Pizza Hut?" , I printed it out for him in capitals he copied 'Pizza HUT' he changed to lower case after P but back to upper case for HUT. He started to type Bronson got BR then deleted and said "no that"s Ricky" then copied BRonson from the desk 'Brousou' used u for n. He then asked "how do you write your name" I printed and he copied 'JANE' "and your husband?" 'RON' " kids?" 'LESLEY' he copied these then typed a line of E's and deleted back to 'Brousou'and inserted a semi colon and some spaces before the u. He then wrote 'even' the end of his name on the paper and typed 'STeueN', he had written v quite clearly but typed u. He then looked for cards to copy from and typed 'HOT CROSSING' correctly and started POISON but with the card held upside down, then corrected and turned it round, deleted the NO and completed it correctly, he added some numbers , deleted HOT and then decided "that's enough".

13.8.87.
Tries to type Bronson independently gets BBR then copies Ricky from the desk. Steven is not concentrating and leaves after this.

3.9.87.
Changed to upper case before starting said "I want the big one" , I typed STEVEN and he typed SSRRTYT , I typed STEVEN then he wrote his name on my paper twice, writing a v in Steven but a U and the a like a reversed p in Ev--- then typed 'SAeuen EUPShs' . He then played around with numbers and copied the date from the screen, inserting stops 3.9.87.

10.9.87.
Steven typed 'KIm' independently and asked "What's your name?" and copied from my printing 'jANE'. Steven moves the cursor around so that at times the date is bypassed and appears in the middle of a text. He typed numbers and letters then wrote his name on my sheet of paper, missing the a in Ev--- but correcting and overwriting with small a and added his phone number. He then typed 'SAevn' independently, referred to the page and typed steven EV--- 710304 8 (the numbers were overwritten and corrected as he tried to remember the number) he then went along the top row of letters on the keyboard. He collected cards to copy from and typed 'AMBULANCE PHQNE NUMBER NO (then looked through the cards for yes) YES IN COID' he put in W for M then corrected and asked for help with 'C'in ambulance, used Q for O in phone and I for L in cold but otherwise copied correctly and inserted spaces where indicated. Steven uses spacing quite competently, especially when copying.

29.10.87.
Steven is still tending to want to clear the screen before he starts but now leaves his work in place except for using extended spacing at times.
He collected cards to copy and typed ' OPEN OUT A M BULANCE PUSH ( pressed return) TOILETS DANGER (return) LADIES'
He recognises some of these words, when typing ambulance he asked "What does this say?" then said "I'm looking for this letter, pointing to L, he found the letters quickly, corrected any errors, he could read out some of the words but by sight recognition. He checked on the screen to see if the cursor was in the "right" place and moved until he was satisfied with the position. (Steven had
written "Tony" independently on my notes earlier to help Michelle when she was trying to type HONEY, so he is remembering some names, he also managed KIM without any reference.)

Steven then tried MECC Elementary, he inserted the disk and turned on the machine himself and selected the program number. He enjoys the number sequence in this but also tried the missing letter in the alphabet and is able to select a few.

5.11.87.
Steven used the shift key, said "I want the big word" and typed RIC independently then went to check the printed card and finished RICKY in one reference only, previously he was checking each letter separately. He then typed MPrR for Mark and Melissp for Melissa, checking every second letter then independently typed APPM for Adam and Kim correctly, TOuy for Tony, changing to lower case and back, he then copied EMMP for Emma and STEuu for Steven. He is using P for a and u for v and n. He always puts in capitals deliberately and corrects if in lower case, trying the shift and caps lock until he succeeds. He typed letters of the keyboard starting on the bottom row and working through from left to right on each row. The first two rows were done carefully but the top row had repeats and omissions. He then picked up a book and copied 'SANTAS BOOK' from the cover, typed numbers 1-10 using the telephone to select numbers. He copied 'humpty dumpty' from the book and JANERON from my printing.

19.11.87.
Steven said "First next line" and pressed return, he then wrote Steven Ev--- on my sheet, his small 'a' has a long downstroke making it look like a p in reverse (he uses p for a when typing). He copied this but then deleted and left after saying "no more".

26.11.87.
Steven told me he was going to Shellharbour Square to see Santa. I typed SHELLHARBOR SQUARE he typed TO see TERQSD (Santa) FGJK (Claus) then deleted this and typed 'asdcvbhjlpooiiuytrewq mnb sbaczzxxz' (going to Shellharbour Square to see Santa Claus, the sbaczzxxz was a deliberate attempt at Santa Claus, the rest was moving over lines of keyboard and selecting adjacent letters but this is the first time he has attempted approximations for words. He typed 01 then 10 (said "10") SAR for Steven and again deleted.

3.12.87.
Typed B (independently) then 'rousou', for Bronson, changed to lower case and checked each letter except the last two which were done together, he is still using u for n. He then copied RICKY and MPK (Mark).

1988

10.3.88.
Steven looked for the date on the board, used caps lock key to "get the big one" and copied the date from the board. He then went through letters of the keyboard, saying them out. He then went through the names of the class, typing only the beginning letter, but getting each one right.
'B' (Bronson), T (Tony), J (James), K (Kim), L (Levi), S (Steven), A (Adam), M (Melissa).

17.3.88.
Steven copied the date from my note pad, then collected reading cards and copied 'Weshailaisail THROUGH THE YEAR WITH birthdays here and there' with great concentration, he changed to lower case after the initial letter and typed to 'WITH' then deleted, changed to upper case and retyped, then changed back again to lower case. He uses both shift and caps lock keys until he gets the change he wants, sometimes he presses the shift key and then lets it go without using the lock, but he perseveres until he gets the right combination. He used i for l in shall, b for d in and, his spacing was erratic he seemed to be inserting spaces at intervals, stringing short words together but spacing longer words. He typed numbers 1 to 12, put 01 at first for ten then corrected. He then picked out a book and copied 'i l'l teach my dog i00(100) worbs' he again used i for l and b for d. He was looking for E on the keyboard and having trouble, I said" What does Emma start with?" and he went unerringly to the E, the A for Adam to locate A, he said "cat now" as he typed the C, he located the B by looking for 'Bronson'. He then typed letters across the keyboard and numbers to 12, this time gets 10 right.

24.3.88.
Steven said "Can I take this out?", he wanted to clear the screen. He used the arrow keys to move up and down then said "I want to do some lines" type dashes and slashes and said "one goes that way" indicating the direction of the line. He played around with commas and asked "what's that?" then typed numbers and said "I'm going to rub that out" and deleted, then "That's all I want to do".
14.4.88.
Steven wrote his name on my notepad but in 'mirror writing', going from right to left. He then said "I'll do the date, fourteenth" he typed 14 then deleted to move the cursor, he used the caps lock to get the upper case, typed 'TH' said "I don't want that letter" and changed back to lower case 'Th14' said "Can I get the big one for April?" changes to upper case again and continues, looking at the board to copy 'Th14APRi11988' he used a small i then a capital I for l. He then typed 'JKLSADCVNMBASDFGHJKLWRT' and said "Look, making different letters this time, guess what that says" it says "Today is- (then changed his mind and said) - I like you". He then typed numbers to ten, typed 0 then erased and put in 10. He took my pen and wrote 'Mrs Turan-- asking for help with letters "how do you spell Mrs Tu---- and Mrs Rig----?" He needed some prompting "T for Tony, E for Emma (but said out) S for Steven, R for Ricky, A for Adam, L for Levi as those letters came in. He had an extra A in Tu---- and typed 'Mrs TURAN-- (teacher) Mrs RIG-- (assistant) copying from his own print. He then wrote out his own name independently, reversing the two E's in Steven, putting two N's in Ev--- then overwriting the first one with a small a. He then typed this out correctly ' STEVEN EV--- ' leaving a gap between the two names.

28.4.88.
Steven played around with letters 'BVCXZ NMLKJHGFDSA ASDFGHJKLQW' follows sequences of letters, seldom uses random selection- has spaces between . The first sequence was right to left from the centre of the first row of keys then right to left and moving up to the second row and moving right to left all along that row then back again and finished with the two left hand letters of the top row. He then changed to lower case and added more letters but strung them together, added numbers, seemed unsettled about what to do. He then looked for paper to write but changed his mind and selected a book and copied in upper case ' RED BLUE GREEN' he asked "what does that say? for each, he pressed return to go to the next line and continued 'ORANGE' "What does that say?" but when he asked what's that as he came to purple, I pointed to the book and said "What does it say?" he told me "that says purple, that says pink" when he typed those colours. (Each one was a block of colour with the name underneath, after going through the earlier ones and asking he had associated the colour with the word and was able to identify the word from the
colour shown.) He then called over the teacher and read all of the colours from the book whilst pointing at the words on the screen.

5.5.88.
Steven played around for a while typing letters and deleting then said "I'm not doing any more" but then decided to rewrite the date. He erased and retyped as '1988 5th may' copying from the board. He told me he had bought soap for his mum for mothers day, then wrote on my note pad -SOAP FO MU DAD independently, in capitals, he then typed this, leaving extended spaces and changing to upper case for Mum and Dad. He asked for help with spelling for as he did this and typed 'soap for MUM DAD'
He wrote two reversed B's and an A then Mathew Ev---, using a figure that looks like a nine or reversed p for small a, he then typed BAB
MPTTHEW (Baby Mathew) He asked for help with spelling for Christopher and started with C, I wrote the rest of CHRISTOPHER but he wrote Ev--- and STEVEN Ev--- independently still using the reversed p figure for a. He then typed 'STEVEN EV--- SBVNMCXZCHRISTOPHER EV--- MPTThewEV---'.

12.5.88.
Steven said "Cross the date out it's not the eleventh today" and he retypes 12. 9188 (he was right, I had put 11.5.88) he then deleted this and corrected to 12.5.88. He typed 'cvhnjfhgjkhk' and said "that says Christopher" He did some writing on my note pad- Rbil (Rabbit) BEDE (last E reversed) then some random letters RAdERPEbEDEe. He then typed numbers of letters but interspersed some words copied from charts 'sunny' said "I like you" I typed "I LIKE YOU" and pointed to the words and said them out. He continued with letters and symbols put in 'sunny' again then more letters and copied 'i like you' from the screen, more letters with likkkkkkee appearing then asked me to write "WET and TRAIN", he then copied these and HAT which he repeated four times (I had written this down a sheet for one of the other children) he then copied 'ADAMCAROLADAMLIKES COOK' from this sheet and added MUM DADBEDE independently.

19.5.88.
Steven copied the date said "It's not the fifth" taking out the 5 and adds 1988. He asked me to write MRS TU--- and copied 'mrs TU---' then added ISMT(is my teacher) he deleted this and redid finishing with a shortened version 'TU---ESMTE' then asked me to
write TEACHER which he then copied and asked me to write "MRS COOK IS THE COMPUTER LADY" which he copied as 'MZRS COOK IS THE COMPUTER LADY'.

26.5.88.
Steven said "The date", pressed shift to get capitals and erased typed 'Thurs' then erased and started again 'TObaYTURs bay 26 May 1988' looking at the board, he used b for d changed from upper to lower case, a capital M for May then shifted to lower case and continued to copy from the board 'isiTis (he goes back to put in a capital I and notices that he has left h out of thursday and deletes back over 1988. I show him how to move the cursor back to the error without deleting everything and he inserts the h. and continues 'acolbcIouby bay with sunny brets' (IT is a cold cloudy day with sunny periods).

2.6.88.
Steven said "I want to write that" (the date) he typed 19 the asked" where's the little thing you put in?" I showed him the stop and he put one after 19 then deleted it and typed '1988r6'. He then typed 'bvcpivytrew' and said "that says Bronson is going home today" 'BZX' " Bronson's going home" He checked the name on the desk and typed 'BRONson' then went back and deleted the letters he had used to placeholder his sentence.

16.6.88.
Steven typed his phone number, 713048 deleted an extra 4 and used the zero not letter O ,then typed 'STEVEN EV---'. He continues to use p for a and P for A.

23.6.88.
Steven said "That's not the date" ( I had 23.6.88.) he deleted and typed 1988. He typed 'STEVENEV---' then 'YEQIPY' and said "that says I like you".

27.7.88.
Steven used the cursor to move to the bottom of his text, copied 1988 from the board for the date. He indicated the 27.7.88 I had inserted and said "That's not the date". (He likes to type the month in full) "I'm trying to do mouse" (from story just heard in the library session). He typed m and said "what's next - "o" he thought that out for himself then asked for the next letter, needed help to decide it was 'u' - we went through the possible sounds "a -e - u " .He then sounded out "s" and typed in and asked for the next letter
but found E and changed to upper case before typing it. He then typed C asked "what's next letter for cat? but sounded out and said "A for Adam T for Tony and typed 'CAT" "said Rabbit - R" he type R and asked "is it U for umbrella?" I said "No, it's A" he typed this in and asked for the next letter but inserted the two B's himself , he needed assistance to decide that I came next but added T after sounding out the whole word. He asked "what's next letter for dog?" but typed DUD independently then said "where's G for dog?" and added "it's G for girl". He decided not to retype but added a separate G after being shown the G on the keyboard ( in this instance he did not locate it himself, although he usually does so). Steven then decided "Don't want to do all animals, going to do MUM (- said) A for apple" and typed 'MAM' then 'DUD' (DAD) He said "Boy , Bird", type B and copied OY from the board 'BOY' He then typed a row of G's for girl (checked which letter was G with me) and deleted back over previous typing but retyped BOY the copied girl from the board, he typed i for l (giri) but knew it was wrong, I said "it is L" he said "L for Levi" and found L and corrected to girL. He then copied 'DAD' from the board and read back all the words, he initiated this himself pointing to CAT, then as I pointed to different words he told me what they were. He then retyped 'MUM' and said "That's the next letter" pointing to U. He then asked the teacher to come over and read all the words to her pointing to them on the screen himself. Steven then asked to have a turn with Reader Rabbit, it took him four attempts with this word game to succeed in picking all the ones with G.

4.8.88.
Steven typed his name then showed me a card and said "What does that say" I asked him what it said and he replied "The end" and copied from it changing from upper to lower case. 'STEVEN end ' He picked up a book and said "I'm copying from the book" he found 'The end" in the book, changed to upper case and said "I want to get the little one" and kept changing the shift key until he mastered it and typed 'TheEnd' and said "Look easy!" He read "dog" from a card and said "I'll make up a sentence- where's W for Wombat? He type 'W' then 'ho' and said "The end of where"

18.8.88
Steven copied the alphabet from board charts, he missed out the I and deleted back to correct and retyped. I said "U" after Q and he replied "No I'm doing R, - ...where's the W? The last letter is Z". He then copied words from charts, used i for I in apple "appie" after he had deleted other words then he said "I'm going to do something
"else" and typed numbers 1 to 10. On this day he was not making any independent effort, but showing his knowledge of the alphabet and numbers.

25.8.88.
Steven typed 'EMMP' (Emma, he sometimes confuses p with a) then 'TONY' and KM but corrected to 'KIM' independently. He then said "I'm trying to do Melissa's name" and typed 'Melissa' then checked the other letters on the desk and deleted 'ssa' and changed to upper case to give 'Melissa' then he typed 'STEVEN, 1988 (his date), JuMP' independently (changing to lower and back to upper case). After this he copied from his worksheet from the library session 'LOOK (uses return) OUTYOUSIIIIYCIOWN! (omits spaces and uses upper case to get I for l after changing to small i after viewing III in Silly). He correctly used upper case to get the exclamation mark after asking where it was, he has upper/lower under control and knows to change but sometimes has to try it out first to see what appears on the screen. He again used return to go to a new line as on the sheet and typed (independently- sounding out, after reading from sheet and checking back to earlier typing of jump) 'ICANJUMP', still omitting spaces. He then typed 'BNM' and concluded the session saying "I've finished now".

1.9.88.
Steven announced "I know all the letters for walk" and typed 'Walk' changed to upper case to start then lower for a and back to upper to get I for I - he insists on using this instead of l (Independently). He then copied 'LOOKOUT! THEDOORISSHUT! (exclamation mark inserted independently this time, and a long space to mark new line but no spaces between words). He said "I can put little dots there and inserted...then he said "put it together" where he left a space between C and A in 'ICANWALK' but then corrected, again completing this last part independently sounding out I CAN and knowing "all the letters for walk" Note the use of L here, in upper case the i does not appear to prompt changing, but he still deleted LK and typed 'WAIK'.

20.10.88.
Steven copied from classwork 'goat hopped Gumpy' I said "goat hopped?" Steven said "No the goat doesn't hop "and later copied .. "tipped Gumpy" (* he seems to have deleted this later - check back)
27.10.88.
Steven deleted my inserted date, typed his date '1988' then retyped 27.10.1988. Types and deletes (he is restless, the day is very hot) he wrote DAD on my sheet then typed 'DADD MVM (Mum) Lady' (*again seems to have deleted this -check back).

10.11.88.
Steven copied MEIiSSA from the card and asks "Where's the little e?" he deleted all and typed 1988 for the "proper date" then retyped 'MeiSSA'
he used capital I for 1 again and complained that the small a on the machine was not exactly the same as on the card. He listened to what the class was doing and started to think of words beginning with B "Boy, book, bell" he then copied 'Levi' typed 'EMMA' independently (moves cursor to leave spaces between) then 'TONY' and 'JAMES', saying out the letters, not sounding them out, then 'ADAM'. He then said "Who starts with B?- Bronson" and typed this from memory after checking but did not directly copy. He then typed STEVEN but accidentally inserted an extra E 'SETEVEN' (he used V here, often before he used U) the 'KIM' and 'MICHEIIE' again using I for lhere and for 'Melisse' which were all typed independently. He then said "We'll save it now" (copying my words from previous times) and pressed the ESC key to go to transfer.

24.11.88.
Steven used the cursor to move to the bottom of the text. Read names from the screen as he moved down "Melissa Kim Steven Emma"then used the cursor to move previous work up the screen. He wrote CIOCK on my sheet with a capital K overprinted and added two small k's and two capital K's to the writing on the sheet and said "This machine doesn't have one like that, pointing to the small letter he had written, only that, pointing to the capital K he had written. When typing he uses the shift key and deletes when the result is not what he intended. Steven then independently typed 'CIOCK' - clock is the word for the lesson today. (He is still using I for l). He said "I hate Tony, he fights Bronson" and copies names from wall charts : Levi EMMA TOny JAMES ADAMV steven (his own name independent but with small letter) Michelle MeliSSA KiM.

1989

10.3.89.
Steven wrote NIKC for Nick on paper, wrote Mssa then changed this to Meissa, then wrote SIKC and said "That's how you do Nick's name." I said "No, what does that say?" he said "Sick." He then wrote Mrs k then changed to KIM "That's Kim" then typed 'KIM Melissa NIKC MRSKOOK102030405006708090' (saying out the numbers as he types) 100110200220 (he wrote 200 220 on my sheet). He then typed STEVENEV--- 9 (his age).

14.3.89.
Starts off with his name no space between the two names then typed MEiSSAMO---- (no space, but leaves space before the next name) TONYMN.

21.4.89.
Steven typed 'SPSR ' asked "Is that how you spell SPINNER" I typed it for him and he copied from that 'SPINNER (and typed on) I

IS TO spinner

spinnnn (said "That says to spin")

5.5.89.
Steven put in the date '5may 1989', he volunteered the date, saying "It's the 5th May", he typed 'f' then added 'friay' (Friday) after checking the wall chart. He got out some cards and moved the cursor to the next line and said "I know Mum" and typed 'MUM' independently then copied WHAT, he looked through the cards and said "I could write Mum what clothes is she wearing" and typed 'HAT', he then looked for other words to make up the sentence and typed 'WILL' then deleted everything and typed 'MUM WILL WEAR AN HAT  DAD WILL WEAR ANHAT'

Steven typed in 1988 then 19, used shift /control and changed to upper case and typed MAY, he insisted on leaving 1988. He then typed NMBS (numbers) he wasn't satisfied with this and tried again, this time NUMBRS. He picked up 10 cents and typed 1O 12 , (used the shift key for capital O for zero after trying small o, he wouldn't use 0 zero itself, said "no that's not right' ). He then typed 100, added another O and I said "What is that?" he replied "Three hundred" I told him "No that is one thousand" He added another O and asked "What does that say?"; I told him ten thousand, 10,000, he went on with 100,000 and 1000,000 then deleted all the figures
and retyped NUMBRS. He then typed DANNE but corrected to 'DANE'.

28.7.89.
Steven switched on the computer and inserted disks to start up. He retrieved his file by typing his name. He typed the date as 8.7.1989 and put in stops, he read it out and corrected to 28. he started to type 'ju', changed to upper case and typed JUIY then corrected to JULY.

25.8.89.
Steven started to write a message to the assistant, he said "I can't write Good Luck 'cos I don't know what it starts with, I know how many o's." He said to the assistant "I'm writing about you". He typed "GOOD LUCK (with assistance to start both words then typed 'TO ROSX SULVAN' (O'Sullivan) and added his name.

1.9.89.
Steven typed 1 (for the date) and asked "Do you put in a dot?" I said "Yes" he inserted a stop, then said "It's September", I said "that's the 9th month, you can put in 9 for September". He typed '1.9.1.8.9 ' and said, "1st September, 1989". He wrote on the sheet KIM and said"I can do that in one go", and typed ' kim is sik' he asked "Is that how you spell sick?" I said " There is another letter with the same sound as k you need that too." Steven wrote on the sheet 'SIKC" he corrected his typing to 'sicck' he deleted all and started again as he wanted to change to lower case for i . He retyped and continued 'kim way to day(said I know how to spell Friday and started 'F ' then checked on the board and completed 'friday ' then went on ' Emma and hayley ( asked for help spelling Hayley) want (sounded out want) kim to km bak to skool.' (Fixed up to after first typing only t ).He said "Is that more than Melissa's story? how much did she do? I'm going to write a long story and print all of it". He used the space bar to space out his typing, positioning the cursor and usually leaves large gaps between words. He then got his hand written story and copied from it ' I am going t sydney to run', he omitted the O from to but when he came to the second one he realised he had missed it and wanted to fix it, I showed him how to go back over using the arrow keys and insert the O without deleting. He typed 'my (he said "I know how to spell dad" and continued ) 'dad said weare going to have A BAR B. QVE THERE I WAN TO WIN MY RACES I WANNT TO HAVE FUN .' He said "Mine's a very long story, further than Melissa's is, I am going to
print it all", he wanted to press return to print but it still had to be set up to print, I showed him how it was done and he pressed return. He read out from the screen for the teacher, only needing prompting twice.

8.9.89.
Steven typed the date as 19.89. He used the space and delete keys to position the cursor in the middle of the screen and copied 'ONCE' he said "I'm doing Once upon a Time", he deleted and changed to lower case and typed 'once' then again deleted, moved to the top of the screen and typed 'once' from memory, he copied 'upon', he said "I don't want the big letter" and compared "big and little" Aa. He typed everything in lower case as he copied from the story on the board
'once upon a time the shape family went to the park
peter circle chased after jackie square, he puised the ribbon out of her hair, he felt angry. you stop doing thsat or i wont e your sister again.'
Steven added 'cranky' as his own comment on the story, spelling it himself after asking "Is it C again" when he came to the second 'K' sound as he pronounced the word. I replied "There is another letter with the same sound." He omitted all capitals but put in the punctuation. There were a few errors in his copying, he used i for l and put an extra s in "puised" for pulled and "thsat" for that and missed the b from "be" but the effort was sustained and painstaking.

20.10.89.
Steven typed the date as '20101989' without stops. He told me he had been to see F-------- School and typed 'TOF-------------.
SHCOOI ISAWPRNSIPAI ANDMY CLASSROOM LIKED THE KOOAING ROOM. FROMsteven. (This was in the form of a letter to the school and the spelling was unaided. He used I for L in school and in his approximation of principal, his attempt at cooking used K for C and A instead of C 'KOOAING') He then copied from the board a message to the departing student teacher:'DEAR .MRS. MACINTOSH, WE HOPE YOUR NEW CLASS IS GOOD FOR YOU. WE FEEL SAD BECAUSE YOU'RE NOT COMING ANY MORE. THANK YOU FOR COMING TO HELP US .
LOVE JUNIOR 1
He inserted additional stops after "DEAR & MRS and used I for L in LOVE but apart from that his copying was accurate.
**Melissa**

Melissa is very voluble, has an extensive vocabulary and likes to do things 'her way', she joined the class in May, 1986. At first she was very erratic in her approach.

19.5.86.
Melissa typed with both hands, jabbed at the keys with one finger but obviously imitating someone using a typewriter. She tried to roll paper into the computer. She pressed keys at random and did not seem to connect them with letters or words or speech. I typed Melissa and tried to get her to copy from print to see if she recognised letters, she did not.

3.6.88.
Again used the quick stabbing movements like a typist on the keyboard. She does not appear to recognise letters or numbers.

28.7.86.
Melissa tends to delete and mix up her inputs with previous ones. I am trying to encourage her to type her name. She typed 'MSS' amongst other letters then 'm/e v m', I tried to show her again, typed Melissa but she keeps insisting on "doing it Myself". She told me about "mummy's car" so I typed that with interposed letters from Melissa.

7.8.86.
I pointed out letters for her to type MELISSA got ' MW(- her attempt at M) EHLISSAA'. She insists that Melissa doesn't start with "M" when she sees it. She then told me "MELISSA LIKES CRACKLES" and I typed that for her. She typed MDAXZW,QS UKJISKOP LLLLDEWPL;LA.A and said "that says Melissa likes crackles". She then typed letters, attempting to copy LIKES got LIXXXXXXKKKK K K K' I pointed out K but she insisted on X for a while, then went to K. The typed randomly.

18.9.86.
Melissa wanted to write "Melissa likes the computer", she did this, I pointed out the letters for her, she changed to lower case then back
to upper case as she went along. She is still not really making the connection between letters on the keyboard and spoken words and tends to type random letters, saying out letters but not typing the ones she says. She insists that A begins her name when in fact it is at the end.

23.10.86.
Melissa made her first really concentrated attempt to type her name copying from my print she typed 'MEliEssa' changing from upper to lower case at intervals. This time she found M and accepted it as the beginning letter. She decided to write about a house and together we drew one on my sheet, she then named and she typed 'DEa' - "House" I typed - Roof Door Windows Garden Bird as she named the parts of the drawing. She then typed a string of letters which she read out as "Children at camp".

21.11.86.
Melissa typed M's then Melissa with assistance, she asked "How do you spell your name?" - I showed her , typing on the keyboard. She then typed Mrs C------ correctly following my instructions, then some random letters , attempted Mummy - MMM----PP, I typed MUMMY, she placeheld with 'AVFDF' tried TSG for Daniel then typed DANIEL correctly following my instructions saying out letters. She took my pencil and put some squiggly "writing" marks on my sheet but also wrote three recognisable M's and an E.

1987

5.3.87.
Melissa started typing mm for Mrs Cook then wrote with pen "Mrs Cook" using representational writing. Then letters for Melissa 'mm mmm', '=-nn z' placeholding for Natalie, then ooooi (10- i for 1).k87 -partially copied from date, I typed in melissa and she copied 'mmelissxa' . She then typed strings of letters k's for Kim, b's for Bronson then random letters. She wrote mnn on my sheet to represent Emma. She typed W for Mrs D------, identified q as 6 , is starting to recognise numbers. She wrote 'b' said "that says mummy" and 'K' "that's Daniel C------' mummy". She is placeholding with a single letter on the computer then insisting on 'writing' on paper what has been done on the computer. I typed 'the fire is hot' she typed v for fire then a space ( she had asked what is space for and I had shown her the space between words) . She is beginning to make connections!
26.3.87.
She typed 'melissa' copying from my sheet. Melissa typed 'B' said "that says mole" I typed MOLE then BEE EVE MOLE at her direction. She then typed 'G' and said "I did C" then 'Z' and said "I did 2 already" - calls out to the teacher to look at her "2" then did 2 correctly and 7- saying them outand continued with numbers, not always matching correctly. She then typed 'EEG' ("Emma G-----") she deletes letters and whole rows at times if she decides she's finished with them. She then typed a 'd' and said "that's a circle and a l (line), she typed 'b' then wrote it out on paper. She placeheld with 'n' for Mr DRUM, wrote down M then found it on the keyboard, added a few other letters and wrote Ers and said "E for Emma" then typed 'MGG' and said "that's an MC" then typed 'K' and said "that's I for kangaroo" (does not match letters typed to the name, but has the correct letter for the word). She then type a's for "Adam Horl---" and 'RR' for Bronson.

30.4.87.
Typed 'm c' (Melissa) found o for "circle" - they had been doing shapes, she represented circle with 'o', she then typed 'a's" for apple. She tried Melissa again and this time produced 'ME1' then passed on to 23.. returned to E for Emma and placeheld with '4KXDXC' after I completed Emma for her. Then 'B' for Bronson, she wrote a number of S's for Steven on my sheet then we typed it together, she started with S and I helped pointing out the rest, afterwards she typed 'e tge' I think this was an attempt at Steven, she then typed random letters.

14.5.87.
Typed 'ME (Melissa) CC (Mrs Cook) R (Ricky) P (Grandma) then adds M for Grandma, B but says "G" for Bronson. Writes H for Hal on my sheet then types 'H', B Bronson and 6 (he is 6) then K="Kangaroo".' She then said "I don't start with that" pointing to M, after we have typed Melissa together. Then she type 'YUU' "Umbrella" and said "Mummy bought Grapespread - good for my teeth", I typed in grapespread and she typed some random letters and 'AAAAA' (Adam).

21.5.87.
Melissa wrote M on my sheet, for Melissa, typed 'H' for Hal 'H' for father, said "My father starts with H" then typed 'R' for Ricky then RW RI' but deleted RI. She then typed 'S' for Steven, said "I" but typed S, then 'K' for Kim, said "B" but typed K, then added M (KM _Kim). She then said "B for vase" but pointed to V. Added 'D' for
Daniel Co------ and said "He starts with DC, write DC". She typed '4' and said "I did four laps" (swimming) 'TV' (running) 'S' "for snake" 'K' "for Kim". She typed 'GBA' said "B for Bronson and B for Adam", but typed A for Adam. Melissa then typed 'BY' "for Yabby". She told me that she had done eight laps and that she had seen "your computer on the Cancer Appealathon on TV", I typed this in for her, then added her comments "And this is what we've got in the library class" - showing me a book. She then typed 'O' for orange and 'B' for Igloo.

4.6.87.
Melissa again told me that she had seen the computer "what is it called?" - the IIC on the Cancer Appealathon. She typed 'M' 'L' for Melissa 'K' "Kim", then tried again and typed 'KKMK' "that says KIM". She then typed 'X' "for x-ray" 'Y' for Yabbie -interspersed with numbers, letters and deletions. She typed BVBT" B Bronson, B Tony" wrote "S for Steven" on my notes then typed, then again "X for x-ray" She found M (Melissa) on the keyboard after writing on my notes together with other letters, h- L- o- 6 and added these, she then typed a string of B's for Bronson. She typed across the middle row of the keyboard then randomly up and down. After this she typed mkmP 'n' "nest" 'k' "car" 'v vvv' "yabbies" 2 "two" 3 "three" 55 "five" 'hhh' "Harry" .

23.7.87.
Typed "The Date" '725488146', said "W" and typed it, 'Z' "for Zebra" "G for Uncle Sam, Y for Yabbie, K for Kangaroo, T for Tony" and typed these. She wrote three circular symbols on my sheet and said "That says dog"

30.7.87.
Melissa started to copy her name from a card, typed 'm9iissi' (9 was used for e -reversed). She typed numbers to 9 and 00 for 10. Started again "T for Tony, J for Mrs Cook (remembered my initial from a few weeks earlier) "You start with J" she said. "W I'll do a W, my mum starts with W, that's her middle name, Dad's name is Hal" . She typed these then "Y for Yabbie, K for kangaroo, K for Kylee Wa-". She is now recognising numbers and letters, she typed numbers and said them out then "B for Bronson, P for pig, w for wombat, F for Alf (used emphasised letter) said them out as she typed. She wrote SFe T then TOY SHOP on my sheet but said "Tony Ma---" as she wrote TOY SHOP.

6.8.87.
Melissa typed 'greafbbb' then said "I'll do my name, I start with E" and typed 'em asss sssssssss dme' "K for Kim W for wombat". I typed Melissa and she copied underneath 'emssuemss' "Melissa". Then 'T for Tony, H for Hal, F - typed 'C' but said "v for vase", then T for Tony, p for pig, D for Daniel - D for dog, Y for yabbie."

19.8.87. Melissa typed T for Tony, S for snake A for Adam - said "Adam is very sick". I printed out ADAM IS VERY SICK, she copied as 'ADAM S SA2 SICK (she typed the S independently for IS, SA2 was her own attempt placeholding VERY but she copied SICK correctly). She then typed M for Melissa, H for Dad, Hal - U for umbrella - F for flower - V for vase. She copied WOMBAT and ZEBRA correctly from my printing, with a few other letters interspersed.

3.9.87. Melissa typed 'AM' for Adam, J for Mrs Cook, J for Jatz' She then said and typed "E for Emma, and M for Emma and A for Emma" then "S for Steven, Y for Yabbie, V for vase, F for Elf (she typed FB so I typed in ELF, she copied and produced 'FVEL') . She then typed HEZ (zebra) and B for Bronson then told me "It's Adam's birthday next Saturday, 27.8.7 of the ninth" I typed in 'Adams Birthday' she typed 'CC' -"cat" and W - "hospital". She then told me "Grandma has a broken arm and broken chin and broken leg and a sore head" She pointed to letters on screen and read out "Grandma is going to have an operation".

10.9.87. Melissa copied her name correctly from my printing. She told me "Ricky lives in Warrawong Rd, he has not been very well, he has been sick many times" I typed this with some help from Melissa.. She then typed 'MBB/ " Mrs D------ has gone for a holiday with Mr D------" She typed 'BERDF7 "7 Carna------ St Be--------" (her address) then typed V "vase' C " but said G_ caterpillar". She then told me "Bronson is in hospital" I typed this, she added b's for Bronson.

29.10.87. melissa typed 'JJ ' "James" 'MSS' "Melissa", said "N" and typed N for Joanne, L for Alf, D for dog KM for KIM. She then typed letters VBUES,SA which she read out as "Get well soon grandma, typed more letters RTHJGR/PVMN//F GHGM and read out "because we love you very very much and Mrs Cook is thinking of you, typed
more letters GTM/, (P...OJDVY and read as "and we hope you get out of hospital". She was writing a letter to Grandma.

19.11.87.
Melissa typed 'BN N M, WT "The wedding is on this Saturday" (using one letter to placeholder each word) RYYYYYYYUUUUJBC "all the people are going to be bridesmaids" ZCQIOOPP2/K "At the Corrimal Uniting Church" JM "James Stanford". She then typed M for Melissa, B for Bronson V for vase, I typed MELISSA and she attempted it with 'MEML ASS(looking for L but typing M and reversing the ending) says out S then continued '/MMMMMMTEE "E "Emma".

3.12.87.
Melissa typed 'KGDDSWW' "Melissa has got the flu today, EEEhbc/a211233467 -the tissues help me for 36 days" then typed 'WWQQA' "Mrs D------ has flu too" She typed more symbols and letters for "Melissa went to Shellharbour Square, Santa Claus was asleep", saying out the words as she typed letters then typed MNBUC/ "Where was Santa Claus, he was asleep". Place holding with letters or symbols.

1988

10.3.88.
Melissa opened by saying "How's the university going?" I said "Very well", "I'm pleased to hear that" she responded. She then said "Thursday 10th March, " looking at the board, and typed 'THRAUBAU1OMAHr'. She then 'wrote' squiggly lines like writing on my sheet and said "Dear Mrs Boxall, I like you very much" - writing a letter. She typed lrdrfqrr' - placeholding with letters, she typed symbols as well. Then K for Kim and J for James and T for Tony> She then attempted to write 1988 independently and produced '0i88888'. She then typed in letters and symbols saying as she did so" Melissa has a sore on her finger". Placeholding words. She then tried Melissa and managed 'messaN', then typed 'JLL" for Levi, JJ for James, KM for Kim, AHGF for Adam, BBBB for Bronson.

17.3.88.
Melissa typed '71 (17) HXCCvbnjmads' said "Today is Thursday". She typed 'JNJB ' for James, 'VVVVVV' for Steven, 'TI' for Tony and wrote three Y's, one the right way and two upside down on my sheet. She then typed the number sequence saying out as she did
so. She took my pen and wrote out Melissa but reversed and interchanged letters 'liasseM' and typed 'MBBVMN' for Melissa. She wrote Bronson as 'LBnnor' the L was inverted. She typed a row of VVVVVVVVVV's and said "all the Y's it says yellow". She then typed 'BBBBBBB' but said "BER Bronson". She typed a string of letters then said "Today is Thursday, Mrs Cook - you are my friend" I typed this and she typed a row of letters '1QAKJHNMBVCXZ|ASD' "that says the boy jumps".

24.3.88.
Melissa started to copy from the sheet, sounding out letters as she did so, when she typed 'V' she said "Y for Yabbie" she was attempting to copy "We shall sail through the year with birthdays here and there" but was distracted and typed only 'WASHA (we shall) VVVVVV (year) TTTT THRH (through) BRDAD (birthday) repeatedly hit D the WERREEERH (here), she lost track of the sequence then typed letters at random saying "G for Giraffe" "n for Nanna, my nanna starts with N". She then typed 'messssssmmmmmmmmj, meee' "That says Melissa Ann Mo----on, it came out really well". She then picked up the clock and moved the hands to10 and said "That's 10 o'clock, where's the ten? and typed '101' . She then typed a string of letters 'jfaszzzzmmmmnnttgkx' and said "That says Happy birthday Sue Ann Buckley".

14.4.88.
Melissa said "I am going to copy what I have done, do you think that's a splendid idea? Where's the B?" She typed E, said "It came out really well". and clapped her hands. She typed i to f naming the letters then said "Have you got a G?" then typed' bkelnow' "w from wombat, n h tf 2" then deleted.
She tried copying from sheet 'bkelnownh' (Be it known that, -she loses track and starts random typing. She then typed 'meilssamo----' sounding out, she used zero for o and said "I'm looking for the i with a dot" then wrote on my note sheet - Mo---- Melissa, with the surname placed above the Christian name. She then said "I want to do Thursday" and typed 'ttt'- "Oh look my T didn't come out", I change to upper case and she typed T again and said "that's right ", looked at the board and copied HUR "have you got a G for glass? Now 14th" she found T but then moved the cursor so that the following letters appeared in front of the T- 'HURAG41T' putting 41 for 14. She said "Are you proud of me?" I said "yes you've worked very hard today" She replied "Tell Lesley Jane about that - you've got a deal!"
5.5.88.
I typed 5.5.88 and asked her did she know why. She said "Yes its 5 today, then its the 6th tomorrow and then the 7th". Melissa asked "What do you start with?" I spelled out JANE, she wrote it down then typed 'JEEAN' and said "It came out really well" then added C "for Cook". She typed G "For Jug" HH HG AAA "for Adam" KKKKKKKKK "for Kim" then a string of random letters and then copied Adam 'AD(RFDR)AM' insertions were unintentional, she then copied 'GAROL' (Carol) and typed 'LAS' (independent attempt at 'likes'). She then said "I'll write Thursday" and sounded out TH typed 'TTHHHHHRRRRRRT'. She wrote on my note sheet 'NEtgiE' and the inverted numbers which she then typed correctly 'NMMMMMMMMNMMMMMMMMNNNNNNNNNNNNN 7712236' and said "My phone number - Grandma is sick, what's your phone number?" I told her and she typed it.

12.5.88.
Melissa informed me "In 1988 Queen Elizabeth has opened Parliament House on Monday". I printed out MONDAY and she copied, said "Could you show me where Y is?" but found it. She then said "What does Parliament House begin with?" I spelt it out and she typed correctly 'PARLIAMENT HOUSE QUEEN' She then decided to type the date put 21 for 12 then asked "What does May start with?" and typed '21MAY9881' getting the year and the day mixed up but numerals correct and completing MAY herself.

19.8.88.
Melissa 'read out' "On Monday Queen Elizabeth opened Parliament House" when her previous week's typing came on screen. She then said "My doll is sick, what does dolly start with?" I tell her and after a few preliminary stabs at the keyboard she typed 'dodi' then asked "What does sick start with?" but attempted her own version 'usscch' the asked "What does tonsillitis start with?" I tell her T and she typed 'ttt tt t t t' and said "That's not coming out well it keeps coming f f f" I changed to upper case and she is satisfied then with 'TTTONS' sounding out 'ons'.

26.5.88.
Melisa said "I've got to do Thursday" and copies from the board 'THUR S' leaving a space between R and S but said "Can you take that out please 'cause it's wrong?" pointing to the space, she then continued to type "THURSBAY26MAY9188' at first type MYY but
corrected and 99 and said "that's wrong and redid as 9188. She then wanted to put "Today is" in front of the date so I moved the cursor and she typed 'TO DAYS' said "I've got to get the dotted i - have you got one?" and changed to lower case. 'TODAYSi' putting S before i.

2.6.88.
Melissa looked at the previous weeks date and said "It's not the 26th it's the 2nd, Mrs Cook why did you put the 26th?- It's June not May, can I have this rubbed off 'cause I can do my own?" She typed 'THURSDAY2JUNE9188' copying from the board and said "Thursday came out really good - D for dog, d for pup, saying out the letters as she typed "AY J U N E 2 - do I need N, have you got an N Mrs Cook? Yes (she finds it) gets 1988 correct at first then changes it to 9188. She then said "I'll do something else now because I think you'd like to see this beautiful work, what does Drink Bottle start with?" She typed DWERTTY (drink) UIOUOPFGH(bottle) then MEILISSA(almost under control) she then typed random letters and went through the number sequence counting through to thirteen. '1234567890111231'.

16.6.88.
Melissa typed THH and deleted extra H 'THURSDY16JUNE9188' " R for Ricky" as she typed R "D for dog" she typed 61 for 16 but deleted and said "oh Mrs Cook I've done it again" and corrected to 16 and retyped JUNE but still used 9188. She then said "that's all now - D -Done".

23.6.88.
Melissa said "Today is Thursday 23 June 1988" She copied from the board 'TODAA, deleted the extra A and said "Where's that Y Mrs Cook, where's the dot? and an S, she looks for apostrophe. She keeps typing t and said "It won't work' I shift to Upper case and she typed 'THRS' and said "It came out really good, I'm going bananas on this computer". 'TODAY THRS'.

27.7.88.
Melissa said " M - what does Monday start with -MO, and typed as she talked, what's N, D for day" she typed a line of N's and said "How did that get there? How frisky". She deleted everything and started again 'monda' then said "The a didn't come out right, where's y - you have'nt got a y, but then finds it and completes 'monday'. She then said "Poker starts with P - Mr P, what else, O,
K., you're kidding". She typed 'pokm' (Maketon Poker, a game they play in class), she added a few commas then said "gone" and finished the session.

25.8.88.
Melissa announced "I'm going to write Emma" She typed EMMA, then said "TONY - TOY", she tried again and this time put in the N, then typed 'TONY' and said "I thought that was missing" (N). She typed two M's and asked me to take one out and then completed MELISSA and KIM. She then typed ST and said "What else for Steven - E?, then U". Steven said "V". Melissa said "He's getting me frustrated" and insists its not V (the typed letter U is left in). She then decides to type "friends", these are her friends, and starts "FRE ",said "E egg", "N". 'D dog" and "S" and typed FRENDS (worked through the letters herself) . She then said "Guess what tomorrow's the 26th, then it's the School Fete on the 27th. Have you got to go anywhere? We'd like friends and parents to come to buy things". She typed '9188' and said "I've done 1988 - unbelievable!". She then copied JUMP from the board, sounding out the letters as she typed. (Jump was the word for the lesson - used in sentences).

1.9.88.
Melissa read out her previous weeks work correctly, then she told me she had some very big news, her mother was going to have a new baby. She typed BAB, deleted and started again, and typed BAB then said "Can I write April, what does it start with -A? LL? " She typed A1 then deleted and typed 'BABAPRLL' then said "The baby's born in April." She then typed 'MELISSA ES ,she said "S for sister" and continued SRIBST' (Melissa is the sister) . She then said "I'm going to write MY first" and typed 'MYDAD' said "He's going to be another father" then typed JAM (checked last letters and completed) JAMES. She then typed 'WALLK 2(to) DO ,said "What's next? " She sounded out D-O- , needed help to decide there was an R. and finished after adding a C.

Finished text:
'BABAPRLL MELISSA ES SRIBST (used return)
MYDADJAMES (no spaces) WALLK 2 DOR C ( This last is a sentence from class language session, using walk as action and performing action to words).

22.9.88.
Melissa returned from the library session and read out all of the sentences on her card, inserting SHE in front of each statement but otherwise correctly.

She then copied the first word from each line diagonally across my page:

tall

long blcak (as she wrote b she said "See this, that's for black")

cloak

blackbigblak

shoes (the first S reversed)

She was very pleased with her reading effort and kept going over it, there was a picture of a witch with a tall black hat and cloak and long pointy black shoes.

20.10.88.

Melissa typed 'TONY' with help from Tony, then EMMA (she sounded this out and said "Is it A for the last letter?" I confirmed this. She then typed ST and discussed other letters with Steven then typed 'STEUEN', again used U for V.

27.10.88.

Melissa typed 'WORK' but asked for help with OR, she then deleted and typed 'melissa' but didn't like the a on the end ("It's not quite right") so she deleted this then retyped and spelled out Mo----, typed this and again deleted. She then typed 'hppy' for happy, said "That's not right" and retyped as 'hpay' then said "Christening I'm going to write that" and typed 'krestenbaby'. 'hpaykrestenbaby' (no spaces).

10.11.88.

Melissa said "Cross KR, where's O?" She typed KR0(zero), deletes this and again asks "Where is O?". I pointed it out and she typed 'KROSS' then said "What does Santa start with? and wrote S on my sheet then SANACS but used K not C when typing and produced 'SANAKS' then said "Santa Klaus".

17.11.88.

Melissa sat for a while pondering, and I said "What are you thinking?" She said "It's a hard decision, I'll do - at 12.0'clock we will get our books" She typed 12 used 00 after it then deleted and used O's '12oo we v go' "What does library start with?" "1?", I've got to do "TO" she typed t in lower case but wanted upper case so she used shift then deleted everything and started again with capitals. The final effort was '1200GOTOLB', she read this out "At 12 o'clock
we go to the library". She then asked "What does that say?" pointing to the control and shift keys, caps lock etc -the ones with 'writing' on them. She then typed GnGa GNGBAMN and said "That says Ginger Bread man".

24.11.88.
Melissa used the cursor to move to the end of her text and typed the date 2411 88. She asked "Have you still got the crocodile print in there"? (She had put it in my folder the previous week and I returned it.) She then announced "I'm doing alphabets" and typed across the keyboard, then read out the letters and deleted everything. (Lacked attention, there was sad news - no baby now, mummy had been to hospital.)

8.12.88.
We tried the program Story Machine on this day (the last visit of the year). Melissa read out "Story Machine" from the screen. I typed in a story and ran it to demonstrate. Melissa then typed 'THE GIRL JUMPS' - checked on the board for spelling of girl (RL) but typed the rest independently, and then typed 'THE BOY RUNS' then reads it out as "The girl is jumpung- the boy is running" when the action is operating. She argues when the machine does not accept some things she types and clears text but then accepts that she must remember spaces and type THE to start for the machine to accept the story. She tried SKPS for skips then changed it to 'RUNS' when SKPS was rejected.

1989

10.3.89
Melissa cleared Nicks' text but retyped 'NICK' then deleted and typed 'MelissA' she started with small m then changed to "bigger"
She said "we went on an excursion" and typed 'wewe tonesctn'

7.4.89.
Melissa informed me "We are going to MaCDonalds" and typed 'WE A R GOETOMACDNOLDS' not satisfied with this she then typed again 'WE ARGOETO MACDONALDS SATADAY (saying out and adding detail as she typed)- typed 'WEI (sounding w-i-t-h, "what does it finish with I asked her?" she told me "TH" and typed in) TH KIMANDME AT WORRAOG (at Warrawong). She then announced "there will be a Rock and Roll Disco on Friday- I'm going to
advertise that" . She typed, centre page, using the cursor to position her text

'ROCLLROLL

DECOONINAPRIL14FIDAY
INTHE60708090'

14.4.89.
Melissa typed 14 4 1989 independently, she knew the date and said "It's the 14th of the 4th. (She deleted the 4 later when making changes). She decided to use the phone and said "I'll ring Nanna and ask the computer to wait". Held an imaginary conversation, asked "How's Nanna and Grandpa and Uncle Tom?" She then said "I'm doing the alphabet" and typed ABC...Z changed the order in the middle then sang through the alphabet and corrected, only missed out LM STUV. She then decide to send a birthday greeting to Janet and typed

'TO JANTHAPPY (deletes and changes to)JANTHAPPY BTHDAY
(used return)
LOTZ ( YU deleted) YOUR CARZZTMELISSA (Cousin).
She then typed some additions 1=1 = 2, deleted this and asked how to get + sign. I showed her and she typed 2+2=4 then deleted and typed 3+3=6 then asked "What does 6+3=?" but counted up and typed 3 immediately after the previous 6 viz: 3+3=63+=24WASGUUDE; (said "That was good" and typed as shown)
She then asked me "What's your address?" I told her and she sounded it out and typed

'55PIESGHWAY (and moved cursor to type underneath) FEEITEE (55 Prince's Highway, FIGTREE) . She then typed rows of I and W letters.

2.6.89.
Melissa typed her name to retrieve her file and moved to the bottom using the cursor. She said "I am in the Mercury, have you seen it? I am going to write it". She typed independently, without spacing: saying out the words "I am in the Mercury with the Signing Choir".

IAMINTHEMRAKAYWITHTHE SONINGCIER ( she called over the teacher and read it out).

She typed 1 and asked "How do you get the plus again?" I showed her, she typed 1+1=2 and used return to go to the next line ,she asked "How do you do = and take away" then checked them both then typed

1-3=4
11-11=22 she deleted the last part because it was'nt right.
28.7.89.
She said "Of course I'm doing the date" and typed 2879189, then corrected to 2871989 but without spaces or stops.
She then said "Yesterday we talked about trees" and typed 'yestUrDAY (used return)
WETOWT (return)
TREESWE WENT OUTSOIDYES URDAY (return)
BYMELISSAABT"
(Yesterday we talked trees we went outside yesterday By Melissa, she read it back and decided that she had missed about so added ABT on the end.)

25.8.89.
Melissa typed
'THETREESARA BEAUTIFULINAUSTRALIA TMISOSULRVNLOVEMELISSA' This was a letter to Miss O'Sullivan (TMISOSULRVN). The only error in the message was the A instead of E in ARA but all spaces were omitted except after the message itself. She was attending to spelling and format.

1.9.89.
Melissa typed independently
'WEAERGOINGTOCAMPINOCTOBER TOMITNBYMELISSA' Again all spaces were omitted, E was in the wrong order in AER and the place name an approximation of MILTON the story was identified as "BYMELISSA". Spelling and format were again the priorities of attention.
Ricky

Ricky joined the class in 1986, his understanding of English was not very good and he had an obvious language problem.

1986

17.2.86
Ricky tried to type his name independently and produced 'rcy', he pointed to the apple on the computer and said "Apple" then tried to type 'apl'. He explored keyboard, trying out letters then copied from my printing of words he said 'cat doggyy and peter' he needed help with the P AND T but found other letters. He then attempted 'dady' independently and typed 'black car' with assistance showing letters to him. "Daddy has a black car".

18.2.86.
Ricky remembered the use of the delete key, he copied from print 'FELL ON HIS HEAD APPLE' (THE APPLE FELL ON HIS HEAD) . He then typed 'RHY' for his name (independently) and copied 'BLACK EYES' - he does not form complete sentences but can find letters on the keyboard quite well. He tried out different keys, exploring the keyboard then carefully deleted everything he had typed that day.

25.2.86.
Ricky tried to type his name copying from my type he produced 'RYCKY' the typed 'RFFGA' , said "Angelina" (placeholding ). He then typed 'FFGFG' (car), he said "Two cars truck three trucks" , I typed this. He then typed 'BBBBB' and said "Baa Baa Black Sheep". He explored the arrow keys and counted the keys then tried to compare them to the arrow indicators on the screen. He could see that they were the same sort of symbol.

3.3.86.
Ricky seems to peer very closely at the screen, he may be short sighted or trying to see into the screen. He tried his name and typed 'FFRRRRRR' I typed it for him and he copied and produced 'RCY' he then typed 'cvcc' pointed to it and said "cat" he then typed 'aaa' for apple, he is typing groups of letters to represent words, he tried cat again and typed 'gggg'. He used the delete key deliberately and the arrow keys to move the cursor around. He is inquisitive about the results of pressing keys and tries to work out what is
happening. He wanted to type Angelina, I typed it for him and he
attempted to copy and produced 'Agfggrgngelina. I typed dog for
him, he attempted to copy and produced 'oood'.

11.3.86.
Ricky independently typed 'RYIKRI" for his name, he typed a few
letters then 'BIKE' copied from print then 'YELLOW BIKE' with
assistance with letters being pointed out. (From his speech "Bike ..
Yellow bike, words are not strung together immediately.) He then
typed 'BCBBBB BBBB' placeholding for "School bus" I then type out
SCHOOL BUS and he attempted to copy and produced 'SSCC'. He then
wanted to write "Fast car", I printed it out and he copied 'XF AST
CAR'. He is beginning to recognise and associate upper case
letters with the keyboard letters. I printed BEACH and he copied as
'BFACH' (mistook the F for E) then 'LIBGGGHT6HOJSE' copied from
my printed LIGHTHOUSE (he found all letters except USE
independently and is attempting to relate upper and lower case
letters. I typed lighthouse in lower case then in upper case and he
pointed to both then typed 'LI Li' looking closely at the letters.

18.3.86.
Ricky wanted to write Black cat and typed gghghg I printed it out
and he copied 'b lack cat' he typed 'bvbvv' and said "Red car", I
printed this out and he copied as 'redcafrr' (only miss hitting keys).
He tried to type his name independently and got 'crykii' , he knew he
needed a big letter for his name and pointed to it and said "big" and
wanted to correct it, I helped him to get the letters in the right
order 'Ricky'.

14.4.86.
Ricky typed 'ANNBN' and said "Angelina" , I typed it for him, then
helped him to type his own name . He typed 'NBNB' and said "Mummy"
(placeholding). He used the space bar to separate words and the
delete key to move back when he had moved too far. He attempted
to copy ANGELINA from my typing on screen and produced
'AaaaaAdd' this had nearly the correct number of letters. He looked
around the room at posters for ideas to write about, he became
quite animated, naming the different things, "Bear, flowers, legs, house, sheep" and looking for something write ,he picked out bear
and typed 'jjffjvbvbv' I typed bear and he tried again and produced
'bb'. He tried "bow" next and type'v then flowers 'cvvccv', legs
'bvbb', house 'bvbbvb', sheep 'vvccv'. He explored the keys and then
decided to write horse , he typed 'bnnbucvv', I printed it out and he
copied from my printing 'horsecv' and again 'horse'. he then tried to
copy DELETE from the screen heading and typed 'DETEETE' he then typed DFHK for girl then copied from my printing 'GIRL'. I then helped him to type 'RICKY HAS BEEN WRITING' by pointing to letters, he put a stop at the end. He then tried out the different punctuation and other marks and said 'Stop' when he came to that one.

28.4.86.
Ricky tried copying Monday from my print after telling me "It's Monday", he typed 'monoay', he found most of the letters but missed o, I pointed it out for him and he used it for d. He tried his name independently and produced 'y irk' then 'KKKIIYRI' (He knows most of the letters but is not ordering correctly). He used the arrow keys to move the cursor around back and forward, and up and down, he is intrigued by this, and pointed to the top of the screen where the arrow keys are displayed and said "Same". He then typed 'NBNJJG' for car, then copied 'RED CAR' from my printing. He then tried "Apple" pointing to the logo and typed 'NBNNAASSD' I printed it out and he copied from print and letter names 'APPLE' then added GHM. He definitely placeholds with letters but the language barrier is a difficulty for him.

29.4.86.
Ricky copied from his book 'COW' then independently typed 'RYIK then RYIIIK' for his name, he is getting a closer approximation now. He copied 'SUN' from my printing then copied from his book UIU MAN UIN THE MOON (Man in the moon)VB YKS(reversed sky) DFF SPIDER'. He needed help to find letters in sun, moon and spider.

2.6.86.
Ricky recognised his name as the text came on screen and said "Ricky"
and typed 'ryckih' then RYYCIH HHHHHHHHHHG (holding down key). He then copied from wall charts 'KANGAROO' and attempted FLAG 'FGGHJH' independently. He then copied his name from his wallet 'RI CKY D---------'. He took coins from his pocket, looked at the coins and typed their values '5CENTS (I helped him to type cents by pointing to letters) 2 CENTS 10 CENTS 5CENTS10'.

1.7.86.
Ricky told me he had seen a big red truck and I typed this for him RICKY SAW A BIG RED TRUCK. He then copied from cards, selecting letters at random at first but then following through words 'GFG SMURF ACK RY HHGGG S DLO EAU APBEFORE 78768 FLGS (missed A out of flags) then typed random letters and tried out
delete, return and space bar, checking to see what happened when he pressed them. He then directed typing from a poster, reading out as I typed - he looked at the words and interpreted with the aid of the pictures and colours "They blow windy leaves fall down orange, red, green and brown". He then transferred his attention to another chart and read out "parts of the body" then attempted to type 'tku' (eye) hhghj (hands, using correct number of letters to placeholder). He definitely connected print on charts to spoken words.

28.7.86.
He copied RCIKY for Ricky from my typing, he retyped this as he realised it was wrong but then did the same again, changed the I from the correct place to after the C. He then copied "TEDDY" successfully but had some difficulty finding D. He then told me "Snow fell in Katoomba", I printed this out for him and he copied as 'SNOM (M FOR W) FELL NIKATOOMBA' (he reversed In to NI but apart from that found letters easily).

7.8.86.
The class were doing an exercise 'I LIKE TASTING >>> Ricky told me "I like tasting butter" and I typed this for him and we spelled it out together B-U-T-T-E-R. He then typed 'RICKY' correctly twice. He told me "I get wet in the rain" and he typed this with some help pointing out letters for "the rain" but he did the rest with prompting on letter sounds. He then typed 'MO R TONY' copying Tony from the chart.

11.9.86.
Ricky typed 'rRl RRRrrrrRRrrrr Ricky r' he used the shift key to keep changing from upper to lower case. He then copied from the board 'RABBIT robot ROBOT'. He then attempted to type his sisters' name 'AHHJYHJU' I printed it out and typed ANGELINA, he tried again and produced ANGGK,K then copied from my typing 'ANGELINA' pointing to each letter in turn. He then tried rabbit independently 'GGHGH' "Rabbit", 'ETTRR' "Robot" 'RIIKI' "Ricky" then copied 'ROBOT again. He then told me in response to questions "Rabbit jumps and hops" and I helped him to type this, pointing out letters. He then typed 'KKFFKKFK' and said "Party, we are going to have a party". I then typed PARTY for him and he copied in lower case letters.
14.11.86.
Ricky copied 'CAR' from my printing and found the letters himself. He typed his name independently and correctly 'RICKY' and started to type PETER, he needed help with ETE in the middle. He then typed 'AKJHJN' for Angelina and told me he wanted to write "AN APPLE FOR ANGELINA" I printed this out for him and he copied as 'AN APPLE FORAYYYTTL ANGFLIA' He then typed 'RFVBVVV' and said "that says Mummy" then typed 'FJTG' "Daddy" he tried PETER again and produced 'PE T DD DDEERR' then typed 'PETERrr' as I said out the letters.

5.3.87.
Ricky typed his name correctly then 'ANGBBGGG' for Angelina. He typed 'SFCVHY' and said as he did this "Sea , I go to the sea" (he was placeholdering with letters). I then helped him to type it out, showing him letters.

19.3.87.
He typed 'riky' and said "Ricky likes cars" He knew li and ca for the beginnings of the words and found k when sounded out, I showed him the other letters and he added 'likes cars'. He then typed 'ricky can till the time', he typed can till with sounding out letters himself but asked for help with the rest.

30.4.87.
Ricky typed his name independently and correctly using all upper case. He then showed me a toy camera he had in his pocket and I said "we should write that down and printed out HAS A CAMERA. He copied HAS A correctly, but then checked on the camera itself where there was a very small embossed label. He continued but now pointed to the camera and the printing and said "Camera" and copied from the camera label 'MADE IN HDYCDKC' (made in Hongkong, the printing was tiny and difficult to see) then added 'CAMRA', copying from my print again. He was interested in what he was doing and very pleased when he had completed this.

14.5.87.
Ricky copied the date, he moved his fingers carefully along the keys looking for the stop, then asked "Where is stop?" He found it after the first time he was shown and typed '14.5.19 (he inserted this himself) and deleted his 87 when he put the 19 in. He then typed 'rickyR' the upper case R was added at the end when he pointed out that it should have "Big letter".
21.5.87.
Ricky typed 'TGY' for TONY then copied from my typing 'TDNY' (used D for O). He then typed 'RED' (colour from class words but he typed independently) and started 'BO but needed help to complete 'BOAT'. He then copied 'LEAV' from chart (autumn colours, but he missed off the ES). He typed Y and said "Yabby" then copied the rest from my print himself and then wanted to write "WALK ON THE SAND", he copied from my print 'MALK ON' (used M for W, then deleted and changed it to 'OLKNA' missing the W and changing the position of the O and A). He then typed 'SB9IV' (Sand), he lost interest in this at that stage and copied 'STEVEN' from the wall chart.

4.6.87.
Ricky copied the date 4.6.87., he used the space bar to move the cursor to place his typing under mine, the spaces and stops were all put in, he deleted and corrected when he missed the second stop. He then typed 'ric', then tried again, used the shift key and deleted and corrected until he was satisfied with 'RICKY' he then attempted to type Steven 'STE77Y' then other random letters and numbers. He then told me "Ricky has been sick" and I typed this for him. He then copied 'STEVEN" correctly but wanted to place it back where his previous attempt had been so I showed him how to 'MOVE' text using the program menu. He placed it after the random letters. We added 'AND IS BETTER NOW' together, he typed 'NZK' for and "IS BETTER' with prompting and sounding out AND HE ADDED 'CGVF' for "Now" then ZX. He then copied from the card directly 'Canyouseetheauhtumncoiours?' He knew the i he had used for l was wrong and wanted to correct it, so I showed him the l and he deleted and corrected to 'colours' but he made no attempt to put in spaces or to correct for the extra h in auhtumn.

2.7.87.
Ricky copied the date but used semi colon instead of stop and again used the cursor to place on the next line. He then copied 'EMMA and added VB FH (for Gordon). He then typed his own name independently 'RICKYO' and said "Looking for small r" . He then typed 'FTYGTYGK' pointed to it and said "Friend", I typed FRIEND and he tried again 'fjuj' he then said "baby" and typed 'xzvcf'. He decided to copy from the calendar and typed 'we see the sun in the day and the moon in the night. We sleep in bed we play at schpool (he copied school from my print but put in an extra p, when copying from the calendar he put in all spaces but once he finished he said
"MACDONALDS" and typed 'mmujyi' and then continued and again put in spacing as he typed 'we wento macoonalos' he copied MacDonalds from my print but used O for D.

23.7.87.
Ricky copied the date but corrected my error of 22 "It's not the 22nd it's 23rd" He typed 23;7; 87 and asked me to "go back" and correct the error. He then typed rows of z's then deleted and started to type his name but deliberately did everything wrong, he was "teasing" and typed 'RKCYI' and said "I tricked you" he left it as 'RCIKY' although he was well aware of the correct spelling by this stage. He then copied from the chart 'It isday' then added his surname and address, copying from a card. 'DE--------(used L for I in De ------) 12 A-- AVE WARR A 74--65.

6.8.87.
Ricky copied from the carry bag he had with him 'pzzAHUTPARTYACK' (missed the P from PACK). He then pulled out items from the bag and pointed to the illustration of each on the bag and named them. He then copied from my printing the items named 'MASK HAT BALLOON DRINK' he typed DRIBK at first and corrected to DRINK, deleting and retyping. He then read back from the beginning to me correctly. Later, when reading back for the teacher, he read back "Pizza Hut " needed a prompt for "Party Pack" but read out "Mask Hat" correctly, needed a prompt for "Balloon and Drink".

13.8.87.
Ricky copied the date as 13;8 87, lining it up underneath my typing. He then typed 'RICKYANGELINAPETERFRANKEMNA AASTEVee.ew.,'. His own name was independent, I helped with spelling Angelina, Peter, Frank but he started the first three letters of Angelina and Peter and the first letter of Frank. he attempted Emma himself although I printed MMA for him he typed AA for Adam and the STEVee.ew., and said "Steven Ev--". I had printed Steven for him but he only glanced at it and continued in his own way.

3.9.87.
Ricky change to upper case and typed his name independently, he played around jumbling up the letters but then deleted and typed it correctly. He then typed 'J jmy' and said "My dog is fluffy", I printed this for him and he copied 'dogisfluffy' without spacing but then wanted to insert spaces and said "Put space in", pointing to the omissions. I showed him how to go back over letters without
deleting and insert the spaces. He then said "I have a kitten is Bandit". I printed this and he copied as 'kit enis bndit' he found the letters himself but omitted the A in Bandit and misplaced a space. He went on "Angelina is my sister" I printed this out for him and he copied 'ANGELINA SISTER       RICKY' he changed to upper case for her name.

29.10. 87.
Ricky typed 'RICKYS TERN' copying turn from the board but using E for U. He told me "Fluffy ran away she was sick" I typed this for him and read it out. He then typed 'PETER FGRG' and said "Pete's sick". He then typed some jumbled letters pointed to them and said "Chair", I helped him sound out letters and type 'CHAIR.'

5.11.87.
Ricky copied from a book with large letters, he had less trouble with this and types much more quickly, sometimes he peers closely at letters. he typed 'INOEPENOENTNPRINCEESSPAT' he used O for D and omitted spaces. He then typed 'JVJMH' for Jolly, then copied as 'JDLLY', this time using D for O.

26.11.87.
Ricky typed 'peTtR' used return to go to the next line and typed 'ahutsDGFFG' and said that says "Peter goes camping" then said "Ricky too" then typed 'ikhjh' (too) then typed 'Ricky' and said "Ricky goes to Shellharbour Square to see SANTA CLAUS" I helped him to type this by telling him the letters but he tried the SANTA CLAUS himself and got SAN - I helped to finish and he typed CL and we sounded out to try AU but I had to help, he added S to the end. He then typed 'IJKHHA' and said "Racing car". I helped him to sound out to find the letters and Mark typed 'REASN CAR' for him. Ricky tried and typed 'REAEN CAR'. He then typed 'Aadfl21248' and said "That's the house number" and typed some random letters. He then said to the teacher "Mrs Do-----I wrote racing car" and pointed to his own attempt.

3.12.87.
Ricky copied from the top of a container 'OANGERLIVEGRAO' (DANGER LIVE CRAB, used O for D and O fo B). He then typed 'HE LIVES IN THE SEA' as I told him the letters but he started off with first letters. He then typed independently 'PETEWR HDGGXN' and pointed to it and said "Peter caught the crab".
Ricky moved into a senior class in 1988 and I was only able to see him occasionally from that time on.

10.3.88.
Ricky wrote his name and a number of letters on my sheet and said "Ricky went in a big boat" he typed 12890455 in front of the date and retyped 10.3.1988. He then typed his name independently and copied from my printing 'MENT INABIGBDAT' he used M for W and D for O.

23.6.88.
Ricky typed '3841701569 and then the date 23.6.88. he used return to go to the next line and typed 'ricky' he said " I am going in a new house down the hill" and typed 'I (TMBXZ placeholder) AM AM GOING NI A MEW HOUSE DOWN THE HILL' I printed out I G and HOUSE for him, the rest he sounded out and checked with me for correct letter, he used reversed letters for IN and M for N in NEW.

18.8.88
Ricky told me "We went to camp" and typed 'WE' than asked me to print it for him. He then copied 'WEWENT ' then attempted 'TRKAWP' (To camp himself, he used TR for TO and K instead of C and again W for M).

3.3.89.
Michelle and Ricky typed together to produce 'MICHELLE AND RICKY R ARE IN THE SEJ SAME CLASS THIS YEAR', Michelle typed her name then Ricky typed his and R, Michelle corrected this to ARE and pointed out the letters to correct it. Ricky typed SEJ and Michelle corrected with SAME and Michelle pointed out the letters for Ricky to complete the rest when he hesitated.
Kylee

Kylee was an original member of the class when the study commenced in 1985. She was very interested and keen to use the computer. She could recognise her own name and write her own and her brothers' names.

23.7.85
Kylee typed her name independently, left a space between her first and second names after being shown the space bar. Her surname had just one letter incorrect but her first name was correct. 'KYLEE W----' she then typed her own story 'TODAY I J PUTEW' I assisted with the spelling of TODAY but the rest was her own invented spelling (Today I got computer). She then typed 'JAS' for Jason independently 'MUGSDAFF' and said "Mummy" then 'DAC' for Daddy and 'MJHGDSA' for Nanny (She had the first two letters right for parents but was placeholder for Nanny).

30.7.85.
Kylee typed 'POP' with assistance sounding out letters and then 'KYLEE' independently. She typed through the numbers but couldn't cope with 10, did '12345678900-L'. She then typed her version of sentences 'JAZ IL MCXZ/' She said "I'm typing Jason is at school, now My Daddy is at work" and as she said the words she typed one letter for each 'RTYUI'. She then typed 'QWWERTYFG HG JHK' saying as she did so, fitting the words to the letters: "My Nanna is at home".

13.8.85.
Kylee typed her name to retrieve her file as instructed and copied from her story in her language book. The printing was in lower case but she had no difficulty with the keyboard upper case letters. She typed 'i i like to wastvcc h' (I like to watch TV, she asked for assistance only in finding k in like).

23.9.85.
Kylee typed her name as 'Kyyiee' she sometimes mistakes i for 1 on the keyboard. She had changed to lower case after the first letter and continued to type 'jason' she asked for help with the last two letters saying "What's next?" until complete. She then attempted 'Nann' with some prompting, I said "What does it start with" and she typed "N then sounded out A and N. She then told me she had a bike and I assisted her to type 'bike' in the same way. She then typed 'KYLEE' (correctly) and 'has abike (copying bike from
previous time and correctly typing 'has a') she continued 'a little red bike' (little was sounded out and assisted but she did the rest herself, sounding out R E D and again copying bike). The end result was 'bike KYLEE has abike a little red bike'.

24.9.85.
Kylee typed her name to retrieve her file (she always does this) and copied the date from my figures '24.9.85.' and put in the stops after asking where it was. She told me "Kylee has a blue car" and I typed this for her. She typed underneath 'Kyilee hsa a new asdfg car' (She used i but corrected with l without deleting. She reversed the letters in has, asked for assistance to spell new then placed held with letters for car before copying from above.)

30.9.85.
Kylee retrieved her file and used school activity for her story topic "I coloured in a motorbike" I helped her to type this then she typed underneath 'yit is a big mcgorbike' she typed independently sounded out b i g but referred to the typing above for motorbike, she wears glasses and probably mistook the c, the g was probably mishit as it lies under t on the keyboard.

1.10.85.
Kylee retrieved her file and told me "We are going to the airport", this was very exciting news, a visit to the airport. It had to be recorded correctly. I printed it out for her and she copied, checking after each letter "Is that right?". She looked carefully for the letters and put in all spaces. 'WE ARE GOING TO THE AIRPORT'.

8.10.85.
Typed 'KYLEE 8.10.85.' independently, then: 'YESTRERDAY I WENTN TO NANA' She copied in part from my print but typed DAY I WENTN without checking.

21.10.85.
Typed her name to retrieve file then Kylee told her story "The lady next door has a clock on the wall. She has a little boy to visit." She started to type 'THE LADY' but asked for help with the last two letters, I printed out NEXT DOOR and she copied this then went on to type 'has a klock' she asked for help with ck "Is it K" I said there is another letter too with the same sound, she said "C " and typed it then I told her the other K goes there too. She typed 'on the'
independently and I helped with WALL then she asked me to write out LITTLE, she typed 'bo.y' to then needed help with visit. 'THE LADY next door has a klock on the wall she has a little bo.y to visit'.

29.10.85.
Kylee retrieved her file, typed the date from my figures then copied from her book: 'The picnic IN THE GRASS.' She put in the stop and all spaces, if she missed one she went back to correct and corrected any letters which were incorrect. She used the delete key to do this. She then typed independently: 'KKYEE KYLEE WA-- Jason234 16 BOYCE AVE.'

18.2.86.
Kylee typed her name and her brothers' name independently then I helped her with her story "MY MUMMY GOES TO TENNIS" by printing this out. She typed 'MY MUMWA-- DADWA-- TENNS' (the only copying was TENNIS but she missed out the i). She corrects when she hits a wrong key. Kylee then typed 'DADWA-- ISON HOLIDAY' (I gave a little help by printing out HOLIDAY but she knows DAY without help. She then decided to type "Cooking in the library" which came out as ' COOKINE LIBRARY', she copied COOKING but used E instead of G, my G may have appeared as a small e to her, she started off LIB herself then copied the rest from my print.

25.2.86.
Kylee typed her name to retrieve file and then copied a story from her book with some help. 'I WOULD BE THU MAN WHO SAYS HAAP-LAI WAULD TELL ALL TDHE PELE TO COME TO THE CIRCUS'. The book is hand written in lower case, I printed out in upper case where she hesitated, D B H MAN WOULD TELL ALL THE PEOPLE . . . CIRCUS. The sentence actually read "I would be the man who says Hoop-La I would tell all the people to come to the circus." This was quite a sustained effort but she did not get tired of it.

10.3.86.
Kylee typed her full name independently without any errors then copied from her book, she said "I am going to write a story from my book" 'IWOULDEBE THE RINGMAYSTER HE IS WEARING A TALLBLACK HAT, SHOES AND a red suit.' I again helped when she hesitated but only printed out RINGM TR HE W B A H, she copied
easily from capital letters but did not always recognise the letter name when spoken.

11.3.86.
Kylee typed her name independently, remembered the space between but missed the A from her surname. 'KYLEE W----' then again typed 'KYLEE'. She copied from her book, she now recognised spoken letters more easily, could copy from small and capital letters and her speed in typing increased. She typed 'THE COW JUMPED O V Er THEM OON' and only needed help with R T N.

24.3.86.
Kylee typed her name and the date, she needed help with the first three letters of MONDAY and copied MARCH from my printing. 'KYLEEWA-- MONDAY 24MAARCH' she then typed 'JASONMUM DAD' independently and then said she would write "I will have Easter eggs" she copied this from my printing and produced 'I will haveeaster esgs' without any assistance. She used shift for the first letter but did not use it for Easter and mixed s for g in eggs.

15.4.86.
Kylee type independently 'kylee mumda iws awa doktu sad i was sik' she asked for help with the first two letters of doctor do and sa for said but the rest was her own effort at invented spelling. "Monday I was away doctor said I was sick".

29.4.86.
Typed her name 'Kylee wa--', she knows she needs a capital for her name and used the shift key for the first name but not the second. Then she said "Nan is going away on holiday and Pop, I'm going to write about that", and typed 'nan is pop dad (Here she said "I know Pop's other name and typed dad ) goi on holeday i amyoi'. The original story was "Nana is going on holiday then Pop was added in and finally Kylee too.I helped with letters for GOING and H L in holiday but the rest was her own attempt, the last part was intended to be "I am going too" but she was rather distracted that day.

19.5.86.
Kylee typed her name and 'NAN POP JASON' then decide to write "I have a brother" she typed 'SKIHAVE A' then asked for help with BROTHER, she copied this then placed a stop at the end. 'SKIHAVE A BROTHER.'
3.6.86.
Kylee typed the date '3. JUNE. 1986.' She put stops in and checked the spelling of June in the folder. She also put a stop between her first name and surname. 'KYLEE.WA--'. She then read from a story book and copied from the book:
'I AM IN THE CARIAMINTHOEOBOX. I AM IN OTHER TENT. I AM IN THE TEEE. I AM IN THE CUPBOAHD.' The book was in lower case and she had some trouble finding T and corrected the accidental use of Q in cupboard but used H instead of R (they do look similar on the keyboard at first glance). Kylee recognises and can spell independently words such as THE, I, AM.

10.6.86.
Kylee typed the date, mistakenly typing 01 at first then corrected with '10. JUNE 1986.' This time she spelled June independently. She used return to go to the next line and typed 'KYLEE IS MY NAME IN THE FOOD' (The only help was pointing out Y for my and OO in food). She used return again and typed 'I GO TO SCHOOL ON THE BUS' independently. The return was again used and she then typed 'DAD GOES TO WORK IN THE CAR' this was done independently but she checked TO on the line above and needed help with IN. She again used H instead of R and I think it may be being mistaken for R. ("Dad goes to work in car" she said as she typed this). She went to the next line and continued 'I WENT TO JUDITH ALAN' she needed help with E in WENT, typed JUD then asked for help to complete JUDITH and typed AL and again asked for help to complete ALAN.

24.6.86.
Kylee typed the date as 'JUN 24 1986.' only placed a stop at the end this time. She used return to go to the next line and typed 'KYLEE WA-- (missed the space at first and deleted back to insert) MUM IS SHOPPING' (also missed the space before MUM and went back by deleting to insert it, she corrected ISS to IS independently and needed help with SHOPPING). She went to the next line and typed, copying from a poster 'DAD LIT THE CRACKERS, AND THEY WENT WHOOSH bang. (Kim) THE FIRECRACKERS UP IN THE AIR.' She picked out the letters carefully and checked some by asking "Is that right?" (Dad lit the crackers, and they went whoosh bang. (Kim) The firecrackers up in the air).

8.7.86.
Kylee typed her name and the date 'KYLEE WAA-- 8.7.86.' and continued 'She said "My mum plays tennis today, I'll write
that", 'TUSDAY MY MUM GOS TO TENIS.' she put a stop at the end of
the sentence then afterwards said "There was a truck crashed on
the road and typed 'TRUK CRASH.' she asked for help with R and H
in CRASH saying "What's next?" then put a stop after CRASH. The
she informed me "There was a new boy on the bus, this morning,
Mathew." She typed ' N EW BOY BUS MATHEW.' She asked for help
with the ending of MATHEW after typing MAT. Kylee used stops at
the end of each sentence but did not go to a new line each time.
She then typed 'JASONWA--'.

28.7.86.
Kylee typed her full name, then said "Dad and Jason went to the
airport, we went to MacDonalds, I better write that" . She typed
'DAD JASON MACDNAS WE MET DAD AND JASON AT THE AIRPORT.' I
helped her to spell AIRPORT, the rest was independent, she
sounded out MET but knew the rest from memory. She then told me
"Mark went to Mrs Burns class, he has a new baby for Mark's
family, Michael Dean." She used return to go to the next line and
typed 'MARK WENT TO MRS BURNS CLASS.' (I helped her to spell
Mrs Burns, the rest she knew. She then typed 'A NEW BABY FOR
MARK'S FAMILY. MCHAEL DEAN ASLEEPINHS BASKET.' The first
part she typed but asked for help with BABY which I printed out
and Family which we spelled out together, I showed her how to put
the apostrophe in MARK's. I printed out MICHAEL DEAN ASLEEP IN
HIS BASKET and she copied from this except for ASLEEP which she
spelled out herself. She missed the I out of Michael and HIS. She
then typed on a new line 'I HAVE A COMPUTER' she asked for help
with HAVE and COMPUTER which I printed for her. She then told
me "I saw Mrs Thommeny in the street" and typed on a new line ' I
SAWMY WRS TH------' I had printed this for her but she used W
for M, just confused the letters.

18.9.86.
Kylee typed the date 18.9.86 and then typed 'watch me ride a bik.'
She needed help to spell WATCH and RIDE but the rest was her own
work. She went to a new line and typed 'Kylee Wa-- can lok at a
book' She changed to upper case for her name, typed all of this
independently then copied 'rainy day' from a chart.

10.10.86.
Kylee typed 'KYLEE WA-- HAD VISITIS CHARL LESLE mary and
auntie auntie LIL' She sounded out VISIT and names, asking "Is
that right?" she copied auntie from my typing for her.
14.11.86.
Kylee typed 'KYLEEWA--' (corrected I TO L) then typed 'NAN AND POP' independently. She moved to the next line with return and copied from her book 'I WOULD BE the man who (used return to conform with book even though there was still space left on screen) says "hoopiaiwou be the ring master.' She used i for l twice and missed the ending of would and missed a number of spaces but has improved, did not ask for assistance.

Kylee left the class at the end of 1986 and I did not have the opportunity to see her again until 1988 when on a few occasions she joined the class.

10.3.88.
Kylee typed the date as '1omaj 10.3.88 then asked me to spell March after trying again 10 Ma(rch) 1988. She then typed 'kylee murebnp (an attempt at Bermagui) I went on holiday to wasdf grandma went to BERMAGUI (she spelled out holiday and asked me to spell grandma and Bermagui). She then typed 'MASPTEWSDF (Mathew) MY FRIEND TYUIIO CAME TO MY BROTHERS HOUSE KYLEEMU (trying MERMAID) THE MAMED THE HEATR (The Mermaid Theatre) TDADAT (Tuesday) THE HE HORSE'. She had written this on a sheet of paper and copied from this.

5.5.88.
Kylee said "Can I write my name down? I'm going to write about my little cousin". She typed 'I AND RAS MICH AND (cousin Michael) she said "He wanted a turn on my bike" then typed 'SO AND' and said "I'll write his name again" and typed 'MICH JASON' she said "I've got a brother named Jason". She then typed 'MUM S AND SO NOPUY' and said "MY MUM IS GOING TO PLAY TENNIS" she then typed 'D PID (dad) IOPJ HOIU MNHG' (Dad goes to work) 'NO NAN ANS MNNNNJH ASDF POP' (My Nan goes to the coast with Pop). She said "I go bike riding sometimes" and typed 'I AND QWER POIUY' (This was typing in sequence four letters along top row and five letters along from the other end of the top row. On this day Kylee just typed letters to placeholder but did not seem to be trying to attempt the words at all.)

2.6.88.
Kylee asked "Can I write the date?" and type 'Ja' then deleted and said "I think it is June 2nd 1988". She typed 'jun 2 988' then she asked "Can I write my cousin's name?" she typed 'michl mcdamnl' and asked "Can I write how old he is?" and added '2' (Michael
--- he is two) She then said "Now I've got to write my other cousins name, JA is in Jacob, is it a K?" then she typed 'jakb' I typed Jacob after it and she typed 'mcdanl 4' and said "He is four, can I write Jason goes to High School?" but typed only 'jason wa-- mum dad nan pop misal (Michelle) goadan (Gordon)' she typed 'mcdanl' and asked "Is that Michael?" , I typed Michael for her, she deleted it and typed 'michl' (Michael) she looked for "H for Helen", typed 'helan' and then said "Right I've got to write Melissa". She sounded out and typed 'mals mcdamnl erin mcdamnl' (Erin M-------) then said "I don't really know how to spell Kimberly but typed 'eir' I showed her and she typed 'kimberly mcdamnl' She said "Will I go down to the next line now?" and pressed return. She typed 'bank' and said "B, is that bike or what?" I typed bike to show her and sounded out bank and bike.

19.8.88.
Kylee typed the date independently and said "I'm going to write all my cousins names, my name first" She typed 'KYLEE WA-- JASON WA-- MICHAL MCDONMD JOCD (Jacob, asked "Is there a J in it) MCDONMD then said "Can I do how old they are?" and typed 2 4 1115 said "Michael 2, Jacob 4, Jason 15, Kylee 11' then asked "How do you spell bike?" and typed 'BICKRE' she sounded this out and asked if there was a K in it she then typed 'JASON' and said "Jason rides a bike, Michael sleeps" She typed 'SLEEP MICHAL' she asked for help with middle letters of sleep but attempted it herself. She said 'I'm going to Nanna's one day" and typed 'NAN KYLEE JASON STAH O M' (Jason staying home by himself) then typed 'MUM DAD GO OT' (Mum and dad go out).

3.3.89.
Kylee typed the date 3.3.89, she wrote on a sheet of paper "kylee Michal JACHD McD--L" then typed 'KYLEE MICHAEL JACHD (I typed in Jacob when she asked if it was right) she continued with'MCDO-AL and tried again 'MCDO--L' she then typed 'I GO TO MY NANNA' independently.
APPENDIX 4

CASE STUDY 1
MONDAY. MICHELLE MICHELLE MICHELLE
I AM 6 I AM 6 I CAME TO SCHOOL ON THE BUS AND DID MY LESSONS
PB
1.10.85
TUESDAY
I LIKE TO FLY UP IN THE SKY
15.10.85
YESTERDAY WAS A RAINY DAY

21.10.85
I HAVE A LITTLE PUPPY
I HAVE A LITTLE PUPPY
HER NAME IS TINY

22.10.85 MICHELLE
MICHELLE'S DADDY CAME TO SCHOOL
MICHELLE 8. 10,85
I WENT TO THE BEACH
18.2.86.

MIHELLE

RED red big little dog Tiny
25.2.86.

BABY LION AT ETHCIRCUS
3.3.86

I WENT TO THE PIZZA HUT
11.3.86

iwouldbeTHEHAPPYCLOWNAT THECIRCUS.
18.3.86

I Like to play with patrina
14.4.86

PATRINA
THE BALLOON FLOATS IN THE AIR
15.4.86

IHADABIRTHDAY PARTYATSCHOOL
COMPUTER
21.4.86

thatsmarkansomefriends thisispatria
red yellow blue red yellow blue
20.5.86.
MICHELLE RAINBOWs green blue yellow
reb brown green blue yellow reb
3.6.86.
tuesday is the day we have the computer
243.6.86.

THE COLOURS are in the sky red and yellow purple.
8.7.86.

TUSDAY. MICHELLE TINY BEAR RED
BONNET CLOWN CLOC OCTAS OCTOPUS CIRCUS LEAVES
IWAGTABAGAGAPLEASS UGGLE
FUR PANTHER CAC KANGAROO
14.7.86.

This is a little horse
THIS IS A BIG HORSE
This is a kite
This is an lemon
This is a tomato
Horse dog saucepan cup horse comb

Michelle has a big bike.
Michelle went to see a show with mummy.
pram GIRL HAS TWO COATS. HOOVER THREE LADIES CAIR RICH
BAGS KIPPINGROPETRUCK FISHING LINETOY GARDEN FORK

29 JULY 1986.
SNOW IS COLD AND WHITE
I SAW A SHOW WITH DANCING AND SINGING.
MY DOG TINY DUGS IN THE GARDEN. WE PLAY WITH BALLS IN THE GARDEN TOO.
I LAUGH AND SHOUT IT IS LOTS OF FUN, I LOVE MY DOG.
TRIANGLE RECTANGLE CLOWN CIRCLE
18.9.86.

michelle ricky starts with R
four starts with f
one starts with o
two starts with t
three starts with t
spider starts with s
frog starts with f

30.10.86

I WISH THAT I HAD DUCK FEET.
MICHELLE

21.11.86.
littiemissmuffet
sat on her tuffet
MICHELLE WENT TO CAMP AT THE CAMP SHE HAD LOTS OF FUN SHE WENT WALKING AND FISHING CLIMBING

12.3.87.
MICHELLE HAS A NEW CLASSROOM

19.3.87.
good news michelle has 10ts Offrienbs

2.4.87.
MICHELLE IS GOING TOBRING HER COMPUTER TO SCHOOL TOMORROW

MICHELLE KIM PE IS GOOD

7 may 1987
red and yellow and blue and green

2.7.87.
MICHELLE ... DID A PICTURE ABOUT HER HOUSE . EMMA IS GOING ON HOLIDAY
WE ALL WENT TO MACDONALDS

19.8.87.
adam is sick today my doll is called

3.9.87.
AFTER LUNCH WEGO TO PE IT IS GOOD FUN
TINY TIM IS MY LITTLEDOG ,

29.10.87.
MICHELLE IS DOING JOT OF WOC AT SCOOL
BEES MAC HONEY MY DOGIS ORANGE AND BLACKTINYTIM

26.11.87.
lookatsamsonsa id paulhestoo diettoget insidehahahasaidkate
Michelle is going to Shellharbour Square to have a hamburger and chips and see Santa Claus.
11.12.87.
michelle can't go swimming today the doctor says she has to have a hearing test.
michelle had a juicy apple the juice ran down her arm.
5.11.87

MICHELLE
THE PRINCESS PAT WAS A PADDLEBOAT ONCE
MICHELLE

11.12.87.
michelle can't go swimminng today the doctor says she has to have a hearing test.
michelle had a juicy apple the juice ran down her arm.
10.3.88

THURSDAY TEN MARCH, 1988
TINY TIM PLAYS WITH A BALL
MICHELLE IS 9

17.3.88.
MICHELLE SEES THE TALL SHIPS. Michelle
is in the train

24. MARCY 1988
MICHELLE KIM IS MY FRIEND YESS HE IS

14.4.88.
i had an Easter egg

28.4.88

MICHELLE LI LIKES KIM WE PLAY

5.5.88
I GOT A BID FOR MY MUM

11.5.88
MICHELLE IT IS A SUNNY DAY I LIKE THE RAINY DAY

19.6.88
MICHELLE JUMPS IN A PUDDLE IN THE RAIN MEGAN IS MY FRIEND

26.5.88
michelle, megan, emma, tony is not here today

2.6.88
MICHELLE MEGAN EMMA TONY IS HERE TODAY

16.6.88
MICHELLE EMMA IS MY FRIEND NO

23.6.88
MICHELLE MEGAN EMMA TONY FRIEND

27.7.88.
TRAINS CAT SUN FISH EMMAS (TENT EMMA) FOX TREES DOG GOAT COW
ELEPHANT

18.8.88.
apple trees orang trees cat sun egg

25.8.88.
MICHELLE MEGAN EMMA TONY FRIEND CAT DOG SUN IN THE SKY
MICHELLE

10.11.88.
BRONSON IS SIK TODAY EMMA IS FREND PATRINA IS TOO

17.11.88.
MICHELLE MEGAN EMMA TONY FREND CAT DOG SUN IS THE SKY

24.11.88.
CLOCK EMMA IS MY FREND
74395
3.3.1989
MICHELLE
RICKY R ARE IN THE SAME CLASS THIS YEAR
APPENDIX 5

CASE STUDY 2
MARK. 23.9.85.  
24.9.85” 
Happy birthday MARK  
I go to beach and plah in the sand  
i SAW the red ladybug in the garden  
i am going to have a partyyy  

1.10.85  
tuesday thursday saturday donna mark is going to play lunch  

15.10.85 tuesday  
SATURDAY SATURDAY  
TWINKLE TWINKLE LITTLE STAR  
HOW I WONDER WHAT YOU ARE  
UP ABOVE THE WORLD SO HIGH  
LIKE A DIAMOND IN THE SKY  

BAA BAA BLACK SHEEP  
HAVE YOU ANY WOOL  
YES SIR YES SIR  
THREE BAGS FULL  
3 BAGS FULL  
123456789101112”’t  
21.10.85  

azcbnvultikiufkiyyoiu 73ijgjku6679966 676my name is mark  
22.10.85  
donna goes to school sheag  
gone to campcay  
16b mark is 12345678910  
trani  
29.10.85  
This is us swimming mark
MARK 3.10.85
16 BOOIK
16 TO THEBEACH AND PLAY IN THE SAND

25.2.86.

I WOULD BE THE IGH DIVES.
I WOULD CLIMB A TALL LADDER
SNAKE
SWIMING
IN THE SEA

3.3.86.

I HAVE
MY BARG.
AT SCHOOL

10.3.86

the cow jumped over themoon.
rudolph the rednosedreindeer

18.3.86

thats my house.
donnais a soool
mark.f
16bookstdapo

24.3.86

I WOULD BETHE HIGH BIVER.
I WOULD Jumpdown INTO THE
WATER.

7.4.86

sunny CIODY
RENY

MICHEL KOGY
MARK. 16BYOOKSTDOPO

15.4.86

MARK
I WOULD CIMB A TALL LADDE
TO THE TOPOF THE TENT
SUNNE RIANI
MARK

28.4.86
KIM, KYLEE, MICHAEL, RICKY, 1986.
MICHELLEW.
SCHOOL.
MARK .4
TYPPE IN TEXT

29.4.86

MARK.
KIM.
KYLEE
MICHAEL
MARK
16
BOOK.
ST.
HOT CROS BUN

20.5.86.

MAY
201986. I HAV GT NYW SIU I HAVE GOT NEW SHOES KYLEERICKY
MICHELLEPETRINAMARK!
DAPT0614879.TUESDAYFIRDAY
MARK.
SUNNYDAYH0t1234567890-=48024
WINDy

24.6.86.
I SAW ORANGE BLUE RED
AND BROWN FIREWRKS.
MARK. 1234567890-

9.7.1986SADAY.
MARK.PETS.
RIASDY ROOSTER SUN
RUNING IN THE SUN
AND RIN

7.8.86.

THURDAY 7TH AUGUST.
MARK.

IN THE RAIN I GOT WET
1234567890=.
THURSDAY, 11TH SEPTEMBER.
123456789 10
ROBOT RABBIT HAS FUR

TYPE IN TEXT AT CURSOR ESC FOR MENU
THE RABBIT IS FURRY and HAS
LONG IES EARS

10.10.86.
ABCDEFGHIJKLMNOPQRSTUVWXYZ

MARK IS SEVEN YEARS OLD
ON
22ND SEPTEMBER
1986.

BOAT
at figtee WE WENT
TO
BOWLING AT
TEN PIN

14.11.86.
121234567891011

sunday monday tuesday wednesday THURSDAY FRIDAY

saturday
ap1 FUR DONNA

12.3.87
THE. 12TH MARCH.
THIS IS DAVID. AND SUE. AND. WENDY. 12345678910 DAVID is IN THE BUS
DAVID IS IN THE.

THURSDAY
WE HAVF. A PE TYPE IN TEXT AT CURSOR ESC FOR MENU. MOVE.
2 APRIL 1987. THURSDAY.
ONCE UPON A TIME. THERE WAS
NAME. RICKY MARINA MELISSA BRONSON EMMA. MARK. ADAM KIM.
DANIEL. MICHELLE. HEVE BEUN CELLD TODAY.
30 400 APRIL THURSDAY.
RICKY MELISSA TONY STEVEN A GEOOT ON THE BAS ARE GOOD ON THE BUS
THEY GO NAME AFTA SCHOOL AND PLAY

7. MAY. 1987
BAT BOTTLE BROONSON BLUE BY BIRTHDAY BUS BANK BEAR Bb Bb
BEGIN WTIE B
14.5/87
DAVID HAS BOAT
WENDY HAS DOLL
SUE HAS HORSE
1ST 2ND 3RD 123 FIRST SAD SECOND 3RD FLEXIBLE
AISK FLEXIBLE DISK MOVE 830 MOVIE 8.30
TONY
KIM
EMMA
ADAM
 DANIEL
MICHELLE
RICKY
BRONSON
STEVEN
MELISSAMARINA CAME TO SCHOOL WEHF ME COME TO SCHOOL WITH ME

21.5
WE WENT TO MRS BROWN AT 4 DAY TO SLEEP WE WRE HAPPY
MRS DR"SAT HEME WE WENT TO SEE AT MRS D
28.5.87
AT HEME I HT A 3RGAESAT WAC BCUS AT HOME I HAD BREAKFAST WEEBIX
YELLOW YABBY YACHT
YELLOW LAS LEAVES
MARK
TONY
B CLOOT BE GOOD
WE HET A DEUS DAY WE HAD A DANCE DAY
AT SCHOOL ET WAS A VRWEGOOD
TAM TIME WE ALL AT FEN WE ALL HAD FUN AND
AT SCHOOL
MSS DOWSETT WSHAPPY
4 6.87
MEALIE AND MARK WS CAERN
MELANIE AND MARK WAS CRYING
DONNA VEL BAER DONNA IS FEELING BETTER
THURSDAY
THIS IS ASUNNYDAY TODAY HAT DAY CAN YOUSEE THE AUTUMN COLOURS
?!@#$%^&*()_+ GGGGGGGGGGGGGGGg> NEST NITHE TREE
APPLUMMYS
NAET TIME IN THE SAEKY

2. JULY 1987
FEATHER FORKALL FEHIS FISH MRS BAEREN HERT A SEAAM LEAAM IS CEARAN
FRER ME CAERHN)!@#$%^&*()_+)!~(>
()
*"**
DATALIFE ON MONDAY IS HAETDAY HOLLIDAY WAHFT MRS D/
23-7-87
MELIANIE S BIRTHDAY ON FRIDAY.
YES SHE HEAF A PEATE.
A PEASSEAN.
_+?<!@#%^&*()
ADAM DAED CAAAAS THE FHRSH ADAM DID CATCH THE FISH
YAD AND MARK DAY ADAM
YES I SEAEEP IN THE SUNNY DAY NO AT FEAEE H AET SEMME FEAT AEPPLAND
OEATURG BAERTUES
EAT SOME FOOD APPLE AND ORANGE BANANAS
30.7.87
OPEN AND CLOSED IN AND OUT AND POISON STOP AND GO
UP AND DOR
MELISSA:

13.8.87
I WAT TO MRS BROWN 4 NEATS I GO HEME ON FRIDAY I HET SEME BREK FASTS
A BOY PUT ON HIS SOCKS
SCARF AND GUM BOOTS TO GO
OUTSIDE TO THE SNOW.
MARK IT IS COLD
LT IS WINTER LT IS RAINING
20.8.87
I CAN COUNT 1 FROG 2 SOLDIERS 3TEDDY BEARS 4 MUGS KIM

3.9.87
MARK FISH IN THE WATER
DADDY IS GOING TO WEAK TODAY
TODAY IS THURSDAY 3ND SEPTEMBER 10.9.87.
FISH SMIMING IN THE WATAR
MICHAEL
MELISSA
MICHELLE
GOOD AT SCHOOL TODAY
DATALIFE
RECORDREW PLAY F FWAD STOP EJECT
MELISSA
29.(10)87.

Vv Mm Ll Uu Yy Qq Bb Ff Ss
NO DATALIFE & 22 ND MAY 1985
EMMA AND MELISSA TALKEN BAT BOOKS
ON MONDAY ON WEDNESDAY.I WAS CAOOM
TO SCHOOL TODAY.
MARK

19.11.87
NEWS MONDAY MICHELLE AND MEGAN AND JAMES TUESDAY BRONSON MELISSA
WEDNESDAY RICKY TONY THURSDAY ADAM STEVEN FRIDAY MARK AND KIM.
MARK IS PLAYING
26.11.87
HAGY6IKMVMCF SHELLHARBOUR SQUARE
SAER KHUFBCS
SANTA CLAUS

11 12.87.
FOLD ALONG PERFORATIONS BEFORE DETACHING TO STICK; SUNDAY MONDAY
TUESDAY, WEDNESDAY THURSDAY, FRIDAY, SATURDAY PANTA WWF IN THE 200
RED.  MC DONALDS HANAM BRGR GEPS TO.YES. DRREING
APPENDIX 6

CASE STUDY 3
Thursday 9
Daddy Mathew
Bunny Rabbit

26.3.8

Steven STEVEN ZXCV

30.4.87.

SATE VEN10110 010

Stevenazzzzzz tday 1234567890
Today tday I AM TO IIIIII
SCHOOL

SSSS

14.5.87.

BBB BBB BBB BBB

4 June 1987

Steven mcrk 123456 can you see the autumn
colours? ____________________________
6.9.87
2112

Pizza HUT

Brouso: uSTeueN

SCROSSINGPOISON1234TR55T55M5655555
3.9.871
1118 STEVEN SSRRTYT STEVEN SAeuen EUP
Shs
b  1234567890  3.9. 87...12345666ui[=
197654321
9997
29.10.87.
OPEN OUT A M BULANCE
PUSH
TOILETS DANGER
LADIES

26.11.87
TO SHELLHARBOUR SQUARE X TO See asdcvbjlpooiuytrewq mn b sbaczxxz santa claus

3.12.87.
B rousou RICKY MPrk
17.3.88
Wesha i sail THROUGH THE YEAR WITH birthdays here an b there
123456789101112 i i i teach my dog o o o o r b s

24.3.88
dqWrn,NMRTUIOP----------vx

14.4.88
b
Th14APRi11988
JKLSADCVNMBASDFGHJKLWRT

ASDFGHJKLZCVBNMQWE 12345678910
Mrs TURANER MRS RIGLEY
STEVEN
28.4.88
BVCKZ NMLKJHGFDAS ASDFGHJKLQW Adfgjklzcvbnmqwertuyiop
1234567891
RED BLUE GREEN

ORANGE PURPLEP

Pink
1988 5th may
soap for MUM DAD
BAB
MPTThew

STEVEN SMBNMCXZ

CHRISTOPHER
MPTThew

12.5.88
cvhnjfghhjk christopher
bnmzxdfderwqoopjj
vbhj67hbjk18 isunnYCVBNMDSDFGAHGJKL I LIKE YOU
zxbvnn,......``-0976 66sfgh sunny
sgjkll';111hgfsaqwertyyuiopcvnmrtxyuuewqasd i like you
aaaarrrddbbbbiiim
wettrainNATHATHATHATADAMCAROLADAMLIKECOOKOIM UM DADBEDE

19.5.88
1988 mrs TURNESMTETEACHERMZRSCookISTHECOMPUTER LADY

26.5.88
T0baYThURsSbay26 May 1988 is ITisa
colbcloubybaywithsuvvybretRS
STEVEN

2.6.88

1988r6
BR0nson

16.6.88
713048
STEVEN
23.6.88

1988STEVEN! YEQUIPY I LIKE YOU

19 88
mousE CAT
DUD G RABBIT

DUD

BOY

MAM

DAD

Girl

MUM

4.8.88.
STEVEN end TheEnd WHO ??

18.8.88.
ABCDEFGHIJKLMNOPQRSTUVWXYZ

appie 12345678910

25.8.88.
EMMP TONY KIM MeIissA STEUEN 1988 JuMP

LOOK
OUTYOUS!IIYCIOWN!
ICANJUMP BNM
1.9.88.
Walk LOOKOUT!

1988 10.11.
MelISSA
EMMA
/
JAMES
ADAM
BRONSON
KIM
MICHEILIE
M4elisse

WALK LOOKOUT! THEDOOR IS SHUT! ICAN WA
24.11.

Levi
Tony
ADAMV
Bronso
Michelle
Kim

CIOCK

EMMA

JAMES

steven

MELISSA
once upon a time the shape family went to the park. Peter circle chased after Jackie square. He pulled the ribbon out of her hair. He felt angry. "You stop doing that or I won't be your sister again." Cranky
5 May 1989

Mum will wear a hat
Dad will wear a hat

19 May 1988

NUMBRS
DANE
20101989 TOFAIRYMEADOW. SHCOOI ISAWPRENSI PAI ANDMY CLASSROOM LIKED THE KODAING ROOM. FROM STEVEN. DEAR.
MRS. MACINTOSH, WE HOPE YOUR NEW CLASS IS GOOD FOR YOU. WE FEEL SAD BECAUSE YOU'RE NOT COMING ANY MORE.
THANK YOU FOR COMING TO HELP US.
LOVE JUNIOR 1

27 10 1989
BORIS THE BEAR MET MORRIS THE MOOSE DO YOU LIKE RIDLES. BORIS ASKED MORRIS ASKED, HOW DO THEY TASTE? BORIS, "YOU DO NOT EAT RIDLES" MORRIS ASKED, "DO YOU " DRINK THEM?
once upon a time the shape family went to the park. Peter chased after Jackie in the square. He pulled the ribbon out of her hair. He felt angry. You stop doing that or I won't be your sister again. Cranky.

20101989 TO FAIRY MEADOW. SCHOOL IS AWFUL. AND MY CLASSROOM LIKED THE KIDDING ROOM. FROM STEVEN. DEAR MRS. MACINTOSH, WE HOPE YOUR NEW CLASS IS GOOD FOR YOU. WE FEEL SAD BECAUSE YOU'RE NOT COMING ANY MORE. THANK YOU FOR COMING TO HELP US.

LOVE JUNIOR I
My favourite australian Animal is the Koala. It is cuddly and warm and it lives in the trees.

It Eats Eucalyptus Leaves.

by Steven
My dream house has a billiard room with a pool table and a tennis court and has a basketball court and has a spa and a football stadium and it has an indoor pool and has a dog and it has some flowers and it has a pool and a rumpus room and a bedroom and a pond.
We went to the Special Olympics on Saturday. The people watched me.
APPENDIX 7

CASE STUDY 4
b 19.5.86.

melissa MELISSA AZX NNVZx ccfggf\b\b\v\vzvxzzxxzcvnun nbm ,,' bxb cbm .CCXXZZXG\CVZDZC \Z2ZC \\Zv vvx vxccc xccc cccxxz\lqweenzrtfg
\z
\\\zcbsnnzb aga ``'[[[\FCJJKJKJJIKH\\D\\xs\ dxsdcxlccccv[ I CFB NJGM;/MSSXWZ\z\z
\e v m'\MEILSSaaz
MELISSA\\zxzzxxxxx 1111\XX
mummyqwse's car  mummy's car 32

7.8.86.
MEWEH LIISSAA MELISSA LIKES CHOCOLATE CRACKLES MDAXZ,0S LLLLDEWPL;DEW;\LA.A LIXXXXXXXXKKKK K K K NBFE31QE EEEEEEEEEEEEEEmdsDdsssssssdffhjal'\l
18.9.86.

MELISSA LIKES THE comPUTER 1 112222SXX32CFV\AE5555556656777SRRRT MELISSA C NHJj;L/"0A\X 12132345555weuuuuuuuuueez\vc mn56jg. l;/ `\vcx335 hy? o[]]=0p-
789012234 c4 5 6 6 7 8

23.10.86.
b vbvvnvnbubb=-900jhhh UWWW MELiessa Melissa
x bnvcb44444444 55RD SOD. DEa house ROOF DOOR WINDOWS GARDEN BIRD zzawq21289rtiutiigiiguifufufiukijj
21.11.86.

M M M M M M M M M =

melissa mrs COOK MRS COTLASH MMM
CHDHDDDDDHDHDJHDJDJDJD=-=-99987JH76HU6Y5YF5RG64T4TF3F33MMM
----------PP
MUMMY AUFDF TSG DANIEL KDKDKIIRy dkx,,kiihcddfduxjz
MELISSA

14.5.87
E CCFRPM/HB6 K=

MELISSA MELISSA YUU E3D4CE333333S3GXBGB Y67HU6T F7Y HB GRAPESPREAD N N 5 6BYYYU‘ AAAAAAAA ADAM N J 8M/A Y67MGVINMB,NV54555tu l,K,hra1111 \11132gt6h.n ttttttvgtg cbv hb hgn mb b t68tyu m bniiklm nk1 c'

21.5.87.
H FOR HAL H FOR FATHER RWSKM
H HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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30.7.87
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19.8.87
TSORE ADAM S SA2 SICK MH MHULIYTR D DDDDFUUUUUUUUUUUUU NNN

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WOMBAT W TAAA2 EEG 7EEB\A FT
3.9.87.
AM M YY O P CV,,A M
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ADAMS BIRTHDAY FB ELF FUEL KDR 909POF HE22CVB8&WHBNMKL0 P0
87763FC
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10.9.87.
FDRQRTTYK RICKY HAS NOT BEEN VERY WELLM,, HE HAS BENN SICK S30
MANY TIMES MBB/
BERDF7 VGB CGV

GV
444TTTTTTTTTTT

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BZFVHHHHHHHNNHHNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN
MELISSA

29.10.87
JJ MSS N 9PPPLLLLDDD D DDDD DD DDDDD DD D DDDDD DDDDD D NNNN KM CB BN V CVBFHD TYR56 7777777 VBUES,SA GET WELL SOON GRANDMA RTHJGR/PVMN //F GHGM,,BECAUSE WE LOVE YOU VERY VERY MUCH AND MRS COOK IS THINKING OF YOU GTM/,[P..OJDVY AND WE HOPE YOU GET OUT OF HOSPITAL A;L L LFCF FF F FF FF VB HUVO;

J ,

19.11.87
BN N M,WTRYYYYYYYYUUUUKBC 2COI00PP2\ K,JMIUYTR E CWYUIOPQWETYUPOPP MBGCBBBB BV VASE MELISSA ........ VMMMMMM MELIASS\NNNN MMMEE EBNMLKJHGFFFFDSAO,WY.

3.12.87.
KGDDDWW EEEhbc\a211233467 B NU8 V WQQQA NNNN,,.....'''''''3 B BB BPO-} /Y// //.,,\\MBVC\
MELISSA

5.5.88
5

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265.88
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2.6.88

THURSDAY2JUNE9188
DWERTTYUIOUPFGH DRINK MELISSA \ HBGCC42 6NHQ1WA
1234567890111231

16.6.88

THURSDY16JUNE9188

23.6.88

TODAY THRS

27.7.88[[[[
  
monday

pokm

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MELISSA

25.8.88.
EMMA TONY MELISSA KIM STEUEN FREND S 9188 JUMP
1.9.88
BABAPRLL MELISSA ES SRIBST
MYDADJAMES WALLK 2 DOR C

27.10.88
hppaykrestenbaby

10.11.88.

KROSS
SANAKS

17.11.88
120060T0LB

24.11.88
YTHIUOPOWETRT
Melissa
wewetonesctn
7.4.1989

WE ARE GOETOMACDONALDS WE ARGOETO
WEITH KIMANDME AT WORRAOG
ROCLROLL
DECOONINAPRIL14Fiday
INTHE60708090
141989 4.4.89

ABCDEFHIJKNOPQRSTUVWXYZ

LOVE YOUR CARZTMELISSA

3+3=63+=24WASGUDE;55PIESHGHWAY

2.6.89
IAMINTHEMRAKAYWITHTHESONINCIER
1+1=2
1-3=4
3-

\o]\\PP./.\ N , \JA \n

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yestUrDAY
WETOJT
TREESWE
BYMELISSAABT

25.8.89.

THETREESARA
BEAUTIFULINAUSTRLIA TOMISOSULRUNLOVEMELISSA

1.9.89.
WEAERGOINGTOCAMPINOCtober TOMITNBMEILISSA
To The Illawarra Steelers, I hope you win every game next year and if you do you will go up the rugby league ladder table and if you don't I will change to Eastern suburbs.

I am a big fan and Rod Wishart is my Boyfriend and I have the hots for him is sexy lexy mexy kiss kiss kiss you are romantic love Melissa you fan.
My favourite Australian animal is the koala because it is cuddly. It is found at El Caballo Blanco and in 4 states which is in New South Wales, Victoria, Tasmania and Queensland. They are soft and nice and they eat eucalyptus leaves off gum trees.

by Melissa
14.5.1991
17.2.86.
ricky apl apple  efd ddkkkkkkkkkkkkkkkkkkkyrtjfrt tyy
   b   bbbb gggg

cat doggy
and peter  dady
black car

25.2.86.

RICKY RYCKY RFFGGA  ANGELIN
FFGFG CAR TWO CARS TRUCK THREE TRUCKSBBBBB  BAA BAA BLACK SHEEP

3.3.86.

FFRRRRRR RICKY RCY RICKY  cvcccc  aaa ab nh ffhj cat apple gf
9999  99

CAT YYYYY angelinaAgfggrngelina

7bnnn dog dog oood

HHHHHHHHHHH
RICKY

11.3.86.
RYIKRI RICKY GFGFHHFHGF BIKE
YELLOW BIKE
BCBBBB BBBB SCHOOL BUS SSSC
FAST CAR
BEACH BFACHNNNO LIBGGGHT6HOJSE
LIGHTHOUSE
VIJJ lighthouse LIGHTHOUSE L1 ii\ a A

18.3.86
ghghgh black catbvbvv redcafrr
black cat red car
crykii Ricky

14.4.86
ANNBN ANGELINA RICKY NBNB MUMMY AaaaaaAdd x angelina
jffjuvbvbv bearbb v bow cvncuu flowers bvbvvb house vvccv
sheep x
DELETE DTEETE DFHK GIRL
RICKY HAS BEEN WRITING .,

28.4.86
monoay monday
y irK' ricky RICKY KKKIIYRI RICKY
NBNJJG RED CAR NBNNAASSD APPLE GH

29.4.86
COW RYIK RICKY RYIIK YYFYHHVHHHVHC
SUN UIU MAN UIN T HE M OON VB SKY YKS
DIFF SPIDE

2.66.86
ryckiih RICKY RYYCIHHHHHHHHHHH

KANGAROO FGHHJ FLAG R1 CKY
5CENTS 2 CENTS 2 2 10 CENTS 5CENTS10
1.7.86,
RICKY SAW A BIG RED TRUCK.

GFG SMURF ACK R Y HHGGG S
DLO EAU APBEFORE 78768 FLGSTHL Y ok

They blow windy leaves fall down orange red, green and brown.
Parts of the body. tku eye hhghj hands

20.7.86.
RICKY RCIKY
TEDDY SNOM FELL NIKATOOMBA

7.8.86.
I LIKE TASTING - BUTTER RICKY RICKY
I GET WET IN THE RAIN
MD R TONY
11.9.86

Ricky r
RABBIT robot ROBOT AHHJYHJU ANGELINA
ANGGK,K ANGELINA CGHGH RABBIT ETTRR ROBOT RIIKI RICKY ROBOT

RABBIT JUMPS AND HOPS KKFFKKFK PARTY
Party
14.11.86.
car RICKYPETER AKJHJN AN APPLE FORAYYTTT
ANGFLIA AN APPLE FOR ANGELINA
RFVBVVV MUMMY FJTG DADDY PE T DD DDEERR PETERRr

RICKY 5.3.87.
578UIGNJ3FGFT5ANGBBGGG ANGELINA SFCVHY
SEA I GO TO THE SEA

19.3.87
r ricky likes cars ricky can till the time

30.4.87.
R
RICKY HAS A MADE IN HDYCDKC CAMRA

14.5.87 14.5.19 ricky R

21.5.87
RICKY TGY TONY TDNY RED BOAT LEAV

YABBYOLKNA SB9IV STEVEN
RICKY

4.6.87.
4.6.87.
ric
STE77Y5HCF,VZJ
RICKY S8GHMMHNMCBNNM STEVEN

RICKY HAS BEEN SICK N ZK
AND IS BETTER CGVF ZXCanyouseetheauhtumncolours?

2.7.87.
2;7;87 EMMAVB FH
RICKYO
FTYGTYGK FRIEND
figui baby xzvcf
we see the sun in the day and the moon in the night. We sleep in bed
we play at schpoolmmuji(Macdonalds0 we wento macoonalos

23.7.87
23;78RCIKY Itisday

6.8.87
pzzAHUTPARTYACK MASK HAT BALLOON DRINK
13.8.87
13;8 87
RICKYANGELINAPETERFRANKEMNA AASTEvee.ew.,

3.9.87.
RICKY j jmy dog is fluffy kit tenis bndit ANGELINA SISTER
29.10.87.
RICKYS TERN
FLUFFY RAN AWAY SHE WAS SICK PETER FGRGRFHYFUHBBFR CHAIR
5.11.87
S;S;INDEPENOENTNPRINCEESSPAT
JVJMHJDLLY

26.11.87.
peTTr
ahutsDGFFG PETER GOES CAMPING RICKY ikhjh too Ricky goes to
Shellharbour Square to see SANTA Claus IJKHHHA
REASN CAR
REAEEN CARAadf121248ghjuGBBHHFHJHMNGYHYHJ FGHKIHJI

3.12.87
QANGERLIVEGRAO HE LIVES IN THE SEA L
PETEWR HDGGXN
12890455 10.3.1988.
RICKY MENT INABIGBDAT

3841701569 23.6.88.
ricky I TMBXZ AM AM GOING NI A MEW HOUSE DOWN THE HILL

18.3.88
WE WEWENT TRKAWP
APPENDIX 9

CASE STUDY 6
KYLEE
TODAY I J PUTEW
JAS
MUGDSAFF MUMMY
DAC DADDY
MJHGDSA NANNY
POP KYLEE 12345678900-L

JAZ IL MCXZ\ JASON IS AT SCHOOL
RTYUI MY DADDY IS AT WORK
QWERTYFG HG JHK MY NANNA IS AT HOME
i i like to wastvcc h

23.9.85
Kyyiee jason Nann
bike KYLEE has a bike a little red bike
24.9.85.
Kylee has a blue car
Kyilee has a new asdfg car

30.9.85
I coloured in a motorbike
yit is a big mcgorbike
1.10.85
WE ARE GOING TO THE AIRPORT
21.10.85.
THE LADY next door has a klock on the wall she has a little boy
to visit
29.10.85 The picnic IN THE GRASS.
KKYEE KYLEE Jason234
16 BOYCE AVE
KYLEE 3.10.35.
YESTERDAY I WENTN TO NANA

18.2.36.
kylee KYLEEJASON

MY MUM DAD TENNS
DAD IS ON HOLIDAY

COOKINE LIBRARY

25.2.36.
I WOULD BE THU MAN WHO SAYS HAAP-LAI WAULD TELL ALL THE PELE TO COME TO THE CIRCUS

10.3.36

KYLEE
IWOULDEBE THE RINGMAYSTER HEIS WEARING A TALLBLACK HAT, SHOES AND A red suit.

11.3.36.

KYLEE W
KYLEE
THE COW JUMPED OV ER THEMoon .

24.3.36

KYLEE MONDAY 24MAARCH JASONMUM DAD

I will haveeaster esqs

15.4.36

kylee mumda iws awa
doktu sad i wos sik

29.4.36

Kylee
nan is pop dad goi on holeday i amyoi

19.5.36.

KYLEE NAN POP JASON SKIHAUE A BROTHER.

K

KYLEE,
I AM IN THE CAR. I AM IN THE BOX. I AM IN THE TENT. I AM IN THE TEE. I AM IN THE CUPBOARD.

01 10. JUNE 1986.

KYLEE IS MY NAME. I LIKE FOOD.

I GO TO SCHOOL ON BUS
DAD GOES TO WALK IN CAH
DAD GOES TO WORK IN CAR
I WENT TO JUDITH ALAN

JUN 24 1986.

KYLEE, MUM IS SHOPPING.
DAD LIT THE CRACKERS, AND THEY WENT 'WHOOSH'
bang, kim THE FIE CRACKERS UP IN THE AIT.

8. 7. 86.

KYLEE. 8. 7. 86. TUESDAY MY MUM GOES TO TENIS. TRUK CRASH. NEW BOY BUS MATHEW. JASON.

28. 6. 86.

KYLEE. DAD JASON MACNAS WE MET DAD AND JASON AT THE AIRPORT.
MARK WENT TO MRS BURNS CLASS. A NEW BABY FOR MARK'S FAMILY.
MICHAEL DEAN ASLEEP IN HIS BASKET.
I HAVE A COMPUTER.
I SAW MY WRISTOMMENY.

18. 9. 86.

watch me ride a bike.
KYLEE. CAN LOOK AT A BOOK.
rainy day.

10. 10. 86.

KYLEE. HAD VISITS CHARL LESLE.
marey and auntie auntie LIL.

14. 11. 86.

KYLEE. NANNY AND POP.
I WOULD BE THE MAN WHO
says "hoopaiwou bething master."
Iomaj 10.3.88 10 March 1988

Kylee murebnp I went on holiday torwasdf grandma went to BERMAGUI MA SPTEWSDF MY FRIEND TYUIIO CAME TO MY BROTHERS HOUSE KYLEEMU THEMAMED THE HEATR TDADAT THE HE HORSE 5.5.88.
I AND RAS MICH AND SO AND MICH JASON MUM S AND SO NOPUY TENNIS DPID AND IOPJ HOIU MNHG NO NAN ANS MNJH ASDF POP I AND QWER POUY

Jun 2 988 2.6.1988
mich1 mcdaml 2 jakb Jacob mcdanl 4 jason mum dad nan pop misal
goadan mich1 helan mals mcdaml erin mcdaml eir Kimberly mcdaml
bank bike